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DEPARTMENT OF EDUCATION
CITY AND COUNTY OF SAN FRANCISCO
STATE OF CALIFORNIA

COURSE OF STUDY IN GEOGRAPHY AND ELEMENTARY SCIENCE

FOR THE
DAY ELEMENTARY SCHOOLS

APRIL, 1920

DEPARTMENT OF EDUCATION

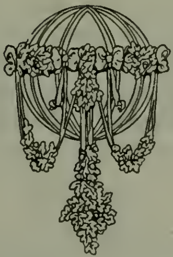
CITY AND COUNTY OF SAN FRANCISCO
STATE OF CALIFORNIA

Course of Study in

Geography and Elementary Science

for the

Day Elementary Schools



APRIL, 1920

JAMES H. BARRY CO. THE STAR PRESS

PRESENTED BY THE OFFICE

of the

Superintendent of Schools

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FOR USE DURING THE SCHOOL YEAR 1920-21

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PREFACE.

Suggestions for a Course of Study in Geography were submitted by a Committee of principals and teachers appointed by the Superintendent, and were reviewed by a second Committee constituted in the same manner. The membership of these Committees was:

FIRST COMMITTEE.

Miss Janet Wade, Principal. Chairman.
Miss Josephine Saunders, Principal
Miss E. E. Hauselt
Miss M. C. Grant
Dr. Roy C. Dickerson
Miss M. F. Nelson
Miss C. McKeon

SECOND COMMITTEE.

Miss K. A. McGivern, Acting Principal, Chairman.
Miss Helen King
Miss G. Hoagland
Miss E. Hussey
Miss F. R. Lewis
Miss Helen Ward
Miss A. B. Cookson

Likewise, suggestions for a Course of Study in Nature-Study and Science were submitted by Committees, the membership being:

FIRST COMMITTEE.

Arthur L. Jordan, Chairman.
Miss Sadie A. Gaffney
Miss Belle M. Stanford
Miss Gertrude A. Christman
Miss Nellie Kelly
Miss Ida M. Manley

SECOND COMMITTEE.

Miss Kathryn McGough, Acting Principal, Chairman.
Miss Olive T. Powell
Miss Alice Belle McBoyle
Miss Ottille Miller
Miss Hilda M. May
Mrs. Eleanor A. Tierney

In the preparation of certain parts of the Course in Geography, the Committees consulted with Dr. H. W. Fairbanks, author of "The Geography of California," of the "Topical Outline of the Geography of Europe," etc., whose assistance is gratefully acknowledged.

The reports of the several Committees have been carefully studied by the Superintendent and corps of Deputy Superintendents, who have shaped the present Course by making such adjustments and re-arrangements as were necessary to accomplish a close correlation among the "social subjects" of the curriculum.

The Superintendent wishes to commend heartily the services of the Committees, and to express his sincere thanks to the principals and teachers, and to all others who assisted in the preparation of the Course.

The Course is to be regarded as tentative and suggestive and is, therefore, placed on trial for one year. At the end of that time, after full and fair opportunity to test its worth has been given, teachers should be prepared to make constructive criticisms upon the Course.

ALFRED RONCOVIERI,
Superintendent of Schools.

San Francisco, California,
April, 1920.

GENERAL INTRODUCTION TO GEOGRAPHY.

The Prerequisite in the Teaching of Geography.

"In the teaching of Geography, as in instruction of every kind, the fundamental condition for success is that the teacher has so thoroughly mastered the subject himself, and takes so much real interest in it, that he can speak to his pupils about it, not in the set phrases of a class book, but out of the fullness of his own knowledge, being quick to draw his most effective illustrations from the daily experience of those to whom he addresses himself."—Sir Archibald Geikie.

What is Geography?

Geography as a science is the study of the earth in its relation to man as the highest form of organic life. As a subject of instruction, it is a means, not an end—a means of bringing the youth into adjustment with his environment. The school study of Geography requires, therefore, that the relations between all life and the earth shall be kept in immediate view, and that the interactions of causes and consequences shall increasingly be brought before the pupil's mind.

Importance of Geography.

Formerly, the tendency in Geography teaching was to supply the child's mind with many unrelated facts of place geography. More recently, however, emphasis in such teaching has been transferred to a study of the principles underlying geographic phenomena, when "based on enough facts to be clear and accepted because they are seen to be large truths and not merely because they are stated with authority."

The appreciation of such fundamental principles based on large truths in a personal relationship is, indeed, a consideration of prime importance in any modern educational scheme. Geography becomes, therefore, a study of very great value as being the best means for the cultivation of scientific thinking that is open to the pupil of the elementary school.

To quote from Dodge and Kirchwey: "He (the pupil) should gain from his work in geography more than from any other school subject the power of thinking accurately and quickly and testing the accuracy of his own and other people's thinking."

(For further treatment of this topic, refer to Dodge and Kirchwey, "The Teaching of Geography," pages 10 to 12).

The Aim of Geography Teaching.

Geography should be so presented that the pupil will come to observe carefully the phenomena of nature and to appreciate the influence of material resources and of physical conditions upon man's distribution and modes of living, past and present.

The objectives of Geography teaching are well summarized by Branom and Beavis in the Seventeenth Yearbook of the National Society for the Study of Education, (1919), as follows: "to impart the more important facts of conventional or practical value; to secure on the part of the pupil ability to interpret properly the geographic factors that enter into problems of timely moment; and to develop an appreciation of the United States intrinsically, and in its relational aspects to the world as a whole."

Or, again, in the language of the Southern California Committee on "Minimum Courses of Study," (1919), the aim of Geography teaching is: "to make us sympathetically acquainted with other folk that the inter-dependence of all of the peoples of the earth may be fully realized."

Plan of the Present Course.

With the foregoing considerations as a basis, the general framework of this Course falls into three sections:

1. A study through observation lessons of the conditions of land and water and other phenomena of nature in the immediate vicinity, and of their effects on life. These lessons depend largely upon the results gained from nature study in the first years of school work.

2. A study of the effects of geographic conditions upon man's home, his occupations, the settlement of communities, and the growth of towns and cities, first as applied intensively to California, and afterwards to the United States and foreign countries.

3. A study of the development of communication and trade with far-away lands, out of which grows a study of world relationships, and of man's life as affected by world geographic conditions.

This Course avoids the introduction of minute detail, and aims to organize the facts and emphasize the full treatment of large, typical units of instruction. Even so, the Course requires on the part of the teacher very definite preparation, selection, and organization of the content for the daily lessons. It should be her happy task so to select and organize from the material suggested as to enable her to develop the essential principles, elements, and features in a satisfactory manner, within her limitation of time. Her initiative and good judgment with reference to aims and results will necessarily be the guide-posts in such a choice of subject matter.

Interesting and important recent investigations on "Economy of Time in Education" and on "Minimal Essentials" point toward the formulation of tentative standards of achievement by the boy or girl at the close of the elementary school period. In specific connection with Geography, what the youth may reasonably be expected to know about that subject, and what he should be able to do because of his study of it, have been made the subject of far-reaching inquiry. In the present Course, broadly considered, an effort has been made to take advantage of these investigations, and to apply the general conclusions so far reached. Those who may desire to pursue further this train of educational research in relation to Geography are referred particularly to the Fourteenth Yearbook of the National Society for the Study of Education, Part I, pages 131 to 147, and the Seventeenth Yearbook, Part I, pages 27 to 40.

Method in General.

The child begins, consciously, or unconsciously, to acquire a familiarity with geographical relationships as soon as he walks and talks. The house relations, the every day facts, surroundings, and activities early come to have a wealth of meaning for the child. In the school course these practical observations and experiences of the pupil should be built upon, for from them is derived the power to image and interpret conditions beyond the immediate horizon. It is essential, then, to keep the old related knowledge in use, and not to close the door on one aspect of the subject when the study of another phase is begun. For that reason, throughout this Course, constant stress is laid on comparisons and contrasts between the geographic conditions and relations of California and the United States on the one hand, and those of distant regions of the earth on the other hand.

Geography teaching is one department of experiential education, and as Bobbitt so well declares, ("The Curriculum," page 236), "Experiential education aims at the greatest possible educational efficiency, substantiality, and practicality of result. It employs interest for the sake of vividness and massiveness of experience; not for the sake of pleasantness. It uses pleasantness as a means; not as an end." The teacher should ever keep these thoughts in view.

Method in Particular.

(a). The Recitation.

. The motivated or socialized recitation, in which the boy or girl is an active participant in the lesson, instead of being merely a passive onlooker or listener,—physically present, but mentally absent,—is the ideal to be striven toward by the geography teacher. The material for the lessons should be gathered and studied, for the most part, in class, the pupils co-operating under the inspiring guidance of the teacher. Thus there will be a conservation of time and energy, and the danger resulting from long questions and short answers will be avoided. Formal tests for results may well be held at intervals, though the quality of instruction is usually sufficiently judged by the directness and fullness of the response at any given moment when spirit and atmosphere are wholesome.

(For further material pertinent to this subject, see Wilson and Wilson's "The Motivation of School Work," Chapter VIII; Dodge and Kirchwey's "The Teaching of Geography," Chapter XV; and the San Francisco Course of Study in History, Civics, and Ethics, pages 12 and 13).

(b). The Problem Method.

To condense from the Baltimore County Course of Study, (pages 193 and 194), the characteristics of a good problem are: (1), it must be of interest to the pupils; (2), it must make the class think; (3), it necessitates the gathering of information; (4), it leads to the modification of generalizations or the making of new generalizations, and the testing of these generalizations by application to specific situations; (5), it necessitates the study of many related problems; (6), it calls for illustrative material; (7), it furnishes ground for discussion.

McMurry holds that "All important human enterprises have this problem-setting character, and our big units of study are reproductions of these typical experiences. The method of teaching such large subjects is a method of solving problems." ("Teaching by Projects," page 237).

The project, he says, accentuates the "demand for the practical and demonstrable . . . it includes several groups of big, constructive units of study. . . . Live projects, wisely selected, not only set up serious problems, but they draw in their wake the knowledge materials required for the understanding and solution of the problems involved," (same, pages 11 and 12).

And, as stated by Freeland. ("Modern Elementary School Practice," pages 6 and 7), "The problem is used to appeal to and develop the child's thought. It is more important that a child learn to think than that he memorize subject matter. . . . We present the various subjects in the form of problems, therefore, in order to develop in the child the ability to think.

"The project may be defined in relation to the problem as something which the child is interested in doing and which may involve thinking, but need not always do so. If it involves much thinking, it may contain problems."

In this Course of Study, the problem represents the major unit of study, while the projects are the minor units necessary to the solution of the problem.

The presentation and solution of problems and projects should constitute a large part of the geography training in the upper grades. The method is illustrated by the following example: With a good physical map before the pupils the larger facts about California, such as position, extent, surface features, coast line, and climate may be brought out and will provide data for the many live discussions that then arise. Such a general problem as the following one may then be introduced: To determine to what extent California might be independent of the rest of the world. The solution of that problem would involve many subtopics or projects, among which may be enumerated food supply, other raw materials, industrial products, means of transportation, and character of population.

(For a more detailed discussion of the problem method, refer to McMurry's "Teaching by Projects"; Freeland's "Modern Elementary School Method," Chapters II and III; and Dodge and Kirchwey's "The Teaching of Geography," Chapter VI, and, for illustrative lessons, pages 236 to 244.)

(c). The Textbook, Supplemental Readers, and Literary Readings.

The text should not be turned into a reading book or one for memorization but, rather, should be skillfully handled for reference purposes in the consideration of problems. What a book has to furnish upon a given subject is to be sought, but not to be rehearsed from memory. In this connection, stress should be laid upon the necessity of securing the main thought of a paragraph, and upon the value of acquiring practical acquaintance with tables of contents and indices.

(For fuller treatment of this subject, consult Dodge and Kirchwey, Chapter IX).

Supplemental readers often supply those rich and varied details of life that are needed if the pupil's range of vision is to be widely extended. Teachers should make a most liberal use of well-chosen supplemental books, especially at points where problems demand full treatment.

To summarize upon this point from Bobbitt ("The Curriculum", page 234): "Whereas a few years ago in progressive school systems, the textbook was the basis of the training with the so-called supplementary books merely inessential collateral readings, at the present time the geographical readers are coming to be the basis of the training with the standard textbook relegated to the position of reference-book or atlas. The more recent geographical readers make a more adequate attempt to reconstruct living experiences within the various lands and less to presenting merely strings of facts".

(For fuller treatment of this subject, consult Dodge and Kirchwey, Chapter XIV).

The fullest use of current events material, and of readings and clippings from magazines and the daily papers, should be encouraged. The "National Geographic Magazine" will be found of much worth. The more important excerpts may well be given place for permanent reference in scrap book collections, or in carefully arranged files. (For further consideration of this topic, see the San Francisco Course of Study in History, Civics, and Ethics. pages 28 to 30: and Dodge and Kirchwey, pages 182 to 184).

Unimagined resources also lie open to the wide-awake and progressive teacher in the skillful correlation of Geography and Literature. In addition to the value obtained from lessons of direct observation, the pupil will find the keenest enjoyment, in all grades, from the telling or reading of suitable stories that reveal the fundamental aspects of life throughout the world, and that, at the same time, possess literary merit. The teacher should seize the opportunity, and enlarge upon it to the full. (Read, upon this point, Bobbitt's "The Curriculum", pages 231 to 237).

(d). **Correlation.**

Geography connects itself readily and closely with other subjects in the curriculum. Observations of phenomena of land and water are the basis of nature study. Movements of the globe are translated through arithmetic. The settlements of communities, the growth of cities and nations, as deeply influenced by geographical relationships, constitute history. Man's control of his environment, shaping it to meet his needs, furnishes the key to the development of agriculture, mining, and commerce. Literature is full of the heroic and romantic stories of man's life upon the globe. Civics is concerned with the organization of national life as affected in large measure by geographical conditions in relation to the environment of the home and society. The teacher able to see these inter-relations and to use the content supplied from so many directions, is the teacher whose work in Geography will be vital.

(e). **Maps and Globes.**

That maps of various kinds—outline, relief, physical, rainfall, and product maps—are indispensable as adjuncts to good geography teaching is today almost universally accepted. "Of all the forms of representing geographical facts and principles", in the words of Dodge and Kirchwey, "a map is the most accurate and at the same time the most suited for producing a given response in the minds of the learners. . . . This is especially true of facts of surface, drainage, climate, the distribution of animals and plants, of commodities, of routes of travel, and indeed of all relative location".

Locational geography should be emphasized. An indispensable consideration is that the places to be located shall be fixed as to actual position on the earth or as to real direction from the schoolhouse or other immediate starting-point, rather than that, as so frequently happens, those places shall be conceived of merely as dots and lines on the face of a piece of colored paper called a map. Wherever possible, therefore, the map should be hung on the north wall of the schoolroom, so that directions on the map will correspond to actual locations on the earth's surface. Young children should not be permitted to study from a Mercator map of the world, since misleading impressions of the relative sizes of bodies of land and water are apt to be given by it.

Map drawing as applied to the production of the offhand sketch map is of definite value. "In this sort of exercise," declares Redway, ("The New Basis of Geography," pages 163 to 164), "nothing but the rapidly produced outline is required, and in its execution not more than half a minute or a minute should be permitted."

While elaborately executed maps have no place in primary classes, yet the pupil should be taught early to sketch from memory approximately the correct outlines of desired geographical areas. It is important that the pupil shall form by progressive degrees the habit of locating on a map whatever places or features may come within the range of his study or notice, and that he shall grasp the idea of scale as applied to the particular map under consideration. Outline maps without names are useful aids in study. The child may look from the book to the outline map to test his knowledge. Such maps may be placed on the blackboard with stencil: or freehand sketching of maps giving good proportion may be substituted.

As Wiswell says justly and forcefully: "To gain full advantage of a map, not only must it be understood and the main features of it held in mind, but the habit of using it must be acquired. Whenever there is occasion it must be consulted, otherwise the ideas which involve location, distance, and direction are certain to be hazy, and short lived."

In the upper grades, the relief map is the first one to be studied; next follows the rainfall map. The relief and rainfall maps show the causes which have shaped mountains and valleys. The soil and the climate determine in very large measure the production areas. These areas, in turn, determine the general location of manufacturing and trade centers, and, hence, of the existence of transportation and commerce.

The product map, as the name implies, should be used to determine production areas only. The following color scheme is suggested for product maps: corn, a light yellow; wheat, a dark yellow; cotton, wool, and rice, white,—the first in solid areas, the second in slanting white lines closer together or farther apart according to the quantity of production, the third similarly in horizontal lines; grazing, a light green; forests, a dark brown; manufactures, light gray; coal and iron, black; petroleum, dark gray; sugar, a very light brown; tobacco, a sienna brown; fish and oysters, blue; gold and silver, by foil pasted on the map. Other colors may be adopted as needed.

In some cases a single product will occupy an entire map, the quantity of the product being indicated by the depth of the shading. In other cases, two or more products which do not overlap may be put upon the same map. Thus, corn and cotton do not overlap. Wheat will not overlap with gold and silver.

A set of these maps should be in each school. One way of accomplishing such a result is to secure a light gray window shade. The natural tint gives a good background for the colors. Window shade fixtures may be posted on the moulding above the blackboard so that the map will be rolled up when not in use.

The product map is an excellent device for the formulation of problems upon the development of industry, the exchange of products, and the location of commercial and trade centers.

(For a further consideration of the use of maps, refer to the 1911 San Francisco Course of Study in Geography, pages 52 and 53; to Dodge and Kirchwey's "The Teaching of Geography", Chapters X and XVII; to Holtz's "Principles and Methods of the Teaching of Geography". Chapters XIV, XV, and XVI: and to Wiswell's "Globes and Maps", particularly pages 51 to 55).

Globes should be in constant use during a recitation. The schools are furnished with large physical, relief, and political globes in sufficient numbers to meet the requirement. The globe is not a luxury, but is, on the contrary, a necessity from the point of view of instruction. The globe habit is a good one to cultivate. To quote again from Wiswell: "An unused globe may be an indication of some lack of preparation or of efficiency on the part of the teacher, and it is assumed that he will gladly free himself from the possibility of such a charge as he has opportunity".

(For a series of Globe Lessons, refer to Wiswell's "Globes and Maps", pages 9 to 50).

(f). The Sand Table.

The sand table functions well in the graphic illustration of certain general rather than specific forms—such, for example, as in visualization of a river system, or of a hill, or a valley.

The sand table at times, however, proves detrimental to good geography teaching—especially in attempts to represent definite large areas—because of the misconceptions of reality that arise from such a method of reproducing on a minor scale the wonderful manifestations of nature.

In the lower grades, wherever the sand table can be applied effectively, this Course recommends its use. In modeling maps on the sand table, great care should be taken to avoid exaggeration of elevations.

(g). Pictures.

An excellent supplementary source of geography material is the picture in its various forms—photograph, post-card, magazine and newspaper cuts, etc. Stereopticon slides are effective in the illumination of dry fact and figure. A wide range of choice of slides is now within reach of the teacher. The stereoscope presents perspective and relief with vividness and a close approach to reality. Stereographs illustrative of many geographic topics may now be obtained without hardship. The "National Geographic Magazine" is a storehouse of illustrations readily available.

(h). The Product Cabinet; and Excursions and Visits to Production Areas, Industrial Plants, and Museums.

In the study of the geography of commerce and industry, specimens of the products of the world in their natural state and in their manufactured form are a valuable means in enabling the youth, through eye inspection, to connect himself with the complex civilization in which he lives. Such samples may be procured readily from stores, factories, and importing houses. This material should be classified and arranged in "product cabinets", and thus become a source of first-hand information in the study of many problems.

Excursions and visits to the Museums—Affiliated Colleges, Academy of Science, Park Museum, and others—and to production areas, factories and other industrial plants, as a further objective method in the teaching of geography, are strongly recommended, (as they are, also, in the San Francisco Course of Study in History, Civics, and Ethics).

Conclusion.

Finally, the teacher of geography in any grade, to do her work well, must know the relations of her specific piece of the work to the whole Course of Study in Geography.

A Selected Professional Bibliography.

Sutherland: The Teaching of Geography, (Silver, Burdett and Co.).

Dodge and Kirchwey: The Teaching of Geography (Rand, McNally and Co.).

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Krackowizer: Projects in the Primary Grades, (Lippincott Co.).

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Wilson: The Motivation of School Work, Chapter VIII, (Houghton Mifflin Co.).

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Wiswell: Globes and Maps, A Teacher's Manual, (Rand, McNally and Co.).

SYNOPSIS OF GEOGRAPHY COURSE.

Content—Textbook

Grade III A.

Observational or Out-of-door Geography.

1. Seasonal changes.
2. Surface features.
3. Occupations and industries of the community.

California State Series Introductory Geography, as reference book for pupils.

Dodge's "Home Geography and World Relations," as a reference book in the hands of the teacher.

Grade III B.

Observational or Out-of-door Geography. Regional Geography.

1. Seasonal changes.
2. Weather conditions.
3. Surface features.

4. Comparative study of local environment.
5. San Francisco and its vicinity.

California State Series Introductory Geography, as reference book for pupils.

Dodge's "Home Geography and World Relations," as a reference book in the hands of the teacher.

Grade IV A.

Home, or Out-of-Door Geography.
Maps, models, and globes.
Regional Geography.

California State Series Introductory Geography, supplemented by Fairbanks' "The New Geography, Book I," in the hands of the teacher.

Grade IV B.

Journey Geography.
The Earth as a Whole, or Globe Studies.

California State Series Introductory Geography, pages 119 to 149, supplemented by Fairbanks' "The New Geography, Book I," in the hands of the teacher.

Grade V A.

California.

California State Series Introductory Geography, pages 278 to 325, supplemented by Fairbanks' "The New Geography, Book II," Chapters I to IV, inclusive.

Grade V B.

California.

California State Series Introductory Geography, pages 257 to 287, supplemented by Fairbanks' "The New Geography, Book II," Chapters V to end.

Grade VI A.

Europe, as a whole.
North America, as a whole.
United States, in sections:
The New England States.

California State Series Advanced Geography, pages 314 to 325, and 1 to 66.

Grade VI B.

The United States, in sections, (continued):
The Middle Atlantic States.
The Southern States.
The Central States.
The Western States.

California State Series Advanced Geography, pages 67 to 176.

Grade VII A.

Territories and Dependencies of the United States.
Other Countries of North America.
General Geography.

California State Series Advanced Geography, pages 177 to 282.

Grade VII B.

South America.
Europe by Countries.

California State Series Advanced Geography, pages 284 to 435.

Fairbanks' "Topical Outline of the Geography of Europe" in the hands of the teacher.

Grade VIII A.

Asia, as a whole and by Countries.
Africa, Australia, New Zealand, and the East Indies.

California State Series Advanced Geography, pages 436 to 514.

Grade VIII B.

Industry and Commerce of the World—a Comparative Study.

California State Advanced Geography, pages 515 to 526.

GENERAL INTRODUCTION TO ELEMENTARY SCIENCE.

Use of Terms.

In this Course of Study, "nature-study" and "elementary science" are not to be regarded as conflicting or different subjects, but are merely the same subject under two different headings.

The Importance of Science Teaching.

It is a fundamental tenet of modern educational theory and practice that the child must be taught in terms of his environment. The child of today is a member of society in an era in which science controls his every-day life. To adjust the child to this scientific world is one of the major tasks of the school and, in itself, is sufficient justification for placing strong emphasis upon a systematic Course in nature-study and elementary science.

That conclusion is strongly supported by Trafton in the following words, ("The Teaching of Science", page 9): "Science has long since passed beyond the stage of a fad, and is now a fundamental subject for the schools in the same sense that any subject is considered fundamental; that is, if the child has not had instruction in that subject, he has missed a vital part of his life, as a result of which he will be handicapped in life; he cannot derive so much pleasure from it, he cannot be so successful, nor can he be of so much service to others."

The Aims of Science Teaching.

Briefly stated, "nature-study aims to teach children to observe for themselves and to think inductively, to acquire a scientific attitude of mind, to appreciate the significance of the commonplace environment, and be mindful of the beauty about them, to form lifelong companionships with inspiring nature. Nature study is really a method rather than subject matter." (Quoted from Downing in "Teaching Elementary School Subjects" by Rapeer and Others, page 346).

In the earlier years, science teaching should aim to develop the ethical and appreciative values that arise from the child's nature experience. Later, the teaching should aim to develop the economic and social values. These various values in their inter-action re-enforce one another as the work progresses from stage to stage.

Ethical values in science teaching arise from training the child to acquire respect and a sense of responsibility for plant and animal life. Appreciative values arise from furnishing him with a helpful kind of enjoyment that makes life more worth living. The teaching aims that develop these ethical and appreciative values are the dominant ones for younger children, and are relatively less important for older children, but should, nevertheless, not be ignored at any time in the Course.

Economic values in science teaching are the outcome of the bearings of science upon practical affairs—as, for instance, a knowledge of beneficial varieties of wild life and injurious varieties, and, again, an understanding of the innumerable applications of physical science which play so significant a part in modern home and business relations. Social values in science teaching grow out of a realization of the existence of organized society, and of the principles underlying it, as exemplified in the dependence and interdependence of all forms of life. Thus, as Trafton states: "In the teaching of science there are opportunities to show children how they may best perform their social duties and co-operate with others to promote the best welfare of all". The teaching aims that develop these economic and social values are the dominant ones for the grammar grades.

(For an excellent treatment of this topic consult Rapeer and Others, "Teaching Elementary School Subjects", Chapter XV).

The Teacher's Part in Realizing These Aims.

Many teachers have been reluctant to undertake science teaching for the reason that they have not felt themselves adequately equipped with a broad training in the subject. Such a consideration, however, should not deter a teacher from entering with zest and zeal into the interests of boys and girls as exhibited in the world of nature about them. "Fortunately", says Downing, "a teacher may successfully teach nature study who has very little book knowledge of the subject. In fact, if she realizes her ignorance and will set herself to learn the characters of the objects about her school, their habits, seasonal changes, and significance, if she will lead her pupils in studying, sketching, making notes upon, and interpreting the commonplace objects and phenomena about her, she may be an eminently successful teacher." Quoted from "Teaching Elementary School Subjects" Rapeer and Others, page 349).

Plan of the Present Course.

This Course provides that the young child shall begin by becoming acquainted with the concrete manifestations of nature in the world about him—such as plants, trees, animals, birds, sun, and weather. From this beginning, the Course leads the child by progressive steps to study the ways of life of animals and plants, to observe the processes in inanimate objects through simple experimentation, and to acquire a foundational knowledge of principles supported by abundant facts.

The success of this introductory work is very largely measurable by the interest aroused—by the eager desire of the pupil to know more about science.

The Course for the Sixth, Seventh, and Eighth Grades is organized on the basis of a series of problems and projects in which material is dealt with that is of vital interest and importance to every intelligent boy or girl. The text book for this study is "The Science of Everyday Life," by Van Buskirk and Smith.

The Material.

Science teaching is characterized by the fact that it deals almost wholly with objective realities in the universe surrounding the child. It is a study of things, not of books; of actualities, not about actualities. Therefore, all work in science must grow out of concrete material with which the child is or has been in actual contact. The teacher, with the assistance of the children, must plan systematically to procure the material for daily use.

(For further development of this topic consult Trafton's "The Teaching of Science", pages 17 to 22).

Method.

(a). In General.

The child has deeply implanted in him two characteristics that furnish the key to effective science instruction. They are: (1), investigating inquisitiveness in regard to natural phenomena; (2), mental and spiritual growth through the satisfaction of that inquisitiveness.

(b). Observation.

The old idea was that there existed a general faculty of observation which, when developed through training, could be transferred for use to any other department of human endeavor. That idea has now been displaced by this other one that the power of observation is limited and specific.

This change of fundamental theory carries with it important implications in science teaching. The newer doctrine makes necessary not only a very careful selection of topics, but also a very careful selection of the kind of observations to be made in relation to those topics. It emphasizes the fact that observation for its own sake is not an aim in science teaching, inasmuch as the mere impartation of information has little value. It follows that the observation of insignificant details has no place in the curriculum. There must always be some problem to be investigated and settled if contact with nature is to gain the results desired. As Trafton says: "Instead of being content to allow the child to observe any material that may be available, we must direct the child to observe those things which in themselves are worth observing on account of the relation which they bear to his life." ("The Teaching of Science", page 44). And, again, "Perhaps the chief elimination in science should come, not so much in the topics studied as in the facts about the topics that are considered and in the observations made. In some cases a topic which in itself is worth while may be chosen for study, but the time may be occupied with many meaningless observations and the real point of interest may be obscured in a mass of detail. These meaningless observations should be eliminated". (Idem, page 34).

(c). Demonstration and Experimentation.

As observation is the prevailing method of the earlier grades, so demonstration and experimentation are the dominant methods of the more advanced grades. To a greater and greater extent as the pupil becomes more mature he should be afforded opportunity to deal with the materials of science at first hand. Demonstrations will necessarily still be conducted by the teacher chiefly, but simple experiments by pupils should be encouraged. By this means the principles and laws of nature should be made of direct application to the facts of one's daily life.

(d). The Recitation.

Supervised activity should be the dominant note in science teaching. The formal recitation has little meaning or worth. Applications of observations and experiments should carry over into the child's daily life in and out of school.

Because of this social aspect of the work, science teaching is easily motivated. Some of these motives have been listed by Trafton as follows:

"1. Identification of common plants and animals, such as birds, trees, and flowers.
2. Earning money, as in gardening, poultry-keeping, and selling bird-houses.
3. Care of pets and domesticated animals.
4. Competition for prizes, as in gardening and building bird-houses.

5. Making collections, as of seeds, leaves, weeds, flowers, newspaper clippings.
6. Making things, as bird-houses and window-boxes.
7. Games and sports.
8. Study of the operation of machines, as engines, motors, and automobiles".

("The Teaching of Science," pages 34 and 35).

At every stage of the Course, definite motivated reactions from the pupil in such ways as those just above suggested should be had. The results of such a procedure will serve as a good index to the effectiveness of the work.

(For a full treatment of this topic, refer to the General Introduction to the Geography Course of Study, and to Trafton's "The Teaching of Science", Chapter IV).

(e). The Problem Method.

The problems and projects should always be planned in such a way as to enlarge the range of experience of the child, particularly in his economic and social relations. Units of study of some size and importance should occupy the attention of the pupils long enough not only for them to gather much experimental information concerning the topics, but also to allow them to organize the material and to relate it to the wide fields of life activities is forcibly expressed by McMurry, ("Teaching by Projects", page 122), "Mere facts in any study, not grouped and related to any strong, replete center of thought, are well-nigh meaningless and worthless".

(For full treatment of this topic, refer to the General Introduction to the Geography Course of Study, and to Trafton's "The Teaching of Science", Chapter V).

(f). Correlation.

The opportunities for correlating science with the other subjects of the curriculum are manifold and manifest. This statement holds particularly for language and literature, drawing, music, the manual arts and home economics, civics, and geography. Therefore, in the teaching of any one of these subjects, the teacher should carefully keep in mind its correlations with the others.

The close connection between nature-study and science, and geography, is emphasized throughout the Course. There is virtually no separation between them in the earliest Grades; while, in the upper Grades, the distinction between Geography and Science problems and projects is frequently merely one of point of view or emphasis in the treatment.

(For a fuller consideration of this topic, refer to the General Introduction to the Geography Course of Study, and to Trafton's "The Teaching of Science", pages 22 to 26).

(g). Excursions and Visits to Production Areas, Industrial Plants, and Museums.

(Apply to nature-study and science the suggestions given under this topic in the General Introduction to the Geography Course of Study).

(h). Visual Education.

The Department possesses sets of stereoptican slides which are valuable aids to science instruction. These may be secured through the Superintendent's office. (See list of slides herein printed).

(i). The Audubon Society.

An effective agency in the study of birds is membership in the Audubon Society. The children when they join such a society become awakened to a responsibility toward birds that they otherwise would not possess. The aim of the Audubon Society (of which there is a local branch in San Francisco is "to stimulate love for and interest in birds, by giving a special scheduled time for the meetings, and exchanging ideas in an organized way, that will result in a general knowledge and care for our feathered friends in the community".

Colored pictures of birds may be obtained from the Perry Picture Co., Malden, Mass., the National Association Audubon Society, 1974 Broadway, New York City; or the Brown Picture Co., Beverly, Mass.

Conclusion.

Finally, the teacher of nature-study and science in any grade, to do her work well, must know the relations of her specific piece of the work to the whole Course of Study in Elementary Science.

A Selected Professional Bibliography.

Krackowizer: Projects in the Primary Grades, (J. B. Lippincott Co.).

Trafton: The Teaching of Science in the Elementary School, (Houghton Mifflin Co.).

Wilson and Wilson: Motivation of School Work, Chapter X, (Houghton Mifflin Co.).

Rapeer and Others: Teaching Elementary School Subjects, Chapter XV, (Charles Scribner's Sons.).

Earhart: Types of Teaching, Chapter VII, and Appendix, (Houghton Mifflin Co.).

NATURE STUDY.

Grades I and II.

Time allotment: Thirty minutes per week.

Guide Topics: Autumn, Winter, Spring.

Introduction.

The work of the First and Second Grades is simple, consisting of apparently informal and incidental observations in relation to direct activities, governed by the seasonal changes.

The children should be encouraged to bring in caterpillars, cocoons, flowers, plants, seeds, leaves; to make simple reports of what the robin, the squirrel, the hen, the rabbit do, and what children can do for them; to plant seeds, and to watch the growth of a plant from seed to flower.

The purpose of this work is to arouse general interest, appreciation toward nature, humane impulse, and to develop knowledge of simple processes in caring for plants and pets.

Every teacher of this subject should read Krackowizer's "Projects in the Primary Grades", pages 128 to 138.

Outline of Work.

Autumn: September, October, November.

1. Animal Life.
    1. Neighborhood Birds.
        a. What birds do: eat, sing, build nests, fly, play, work, care for young, migrate.
        b. Color.
        c. Stories of birds. (Develop ideas of right feeling toward birds; care of young).

2. Insects: caterpillars and cocoons.
   a. Observation of caterpillars as to kinds, colors, movements, and habits.
   b. Collecting of cocoons and preservation of them for spring observation.

II. Plant Life.
1. Color.
   a. Observation of fields, trees, sky, flowers, leaves, and fruits.
2. Flowers, fruits, and vegetables.
   a. Naming.
   b. Sense games.
3. Seeds.
   a. How seeds travel; winged seeds—maple; seeds with sails,—milkweed, thistle., seeds that roll,—pea.
4. Trees.
   a. Identification of the following: fruit tree., forest trees—redwood, pine, maple, ecalyptus.
   b. Shape of leaves. (Collect fallen leaves).

III. Weather Conditions.
1. The sun,—the source of light and heat.
2. Days growing shorter and colder.
3. Daily weather record.

IV. Physiology and Hygiene.
1. Personal cleanliness.
2. Care of the body: hands, face, nails, teeth.
3. Cautions.
   a. Danger in crossing streets.
   b. Danger in playing in streets,—from horses, wagons, automobiles, and street cars.

Winter: December, January, February.
(For treatment, see Autumn Outline of Work).

I. Animal Life.
1. Birds: wild ducks and geese, pigeons, sea-gulls.

II. Plant Life.
1. Seeds.
   a. Germination: peas, beans, corn, and flax. (Study growth. Use moist blotting paper, sponge, cotton, sand, soil.).
2. Flowers: bulbs; Christmas berries.

    3. Christmas trees.
        a. Kinds.
        b. Sources.
        c. Use.
        d. Effect of use upon forests.

III. Weather Conditions.
    1. Daily weather record.
    2. Frost, dew, rain, hail.
    3. Shortening days and cooler weather.
    4. The sun.

IV. Physiology and Hygiene.
    1. Continuation of cautions about the care of the body: skin, teeth, and nails.
    2. Pure air.
        a. Necessity in promoting good health.
        b. Exercise out-of-doors.

Spring: March, April, May, June.

(For treatment, see Autumn Outline of Work.).

I. Animal Life.
    1. Birds: robin, humming bird.
    2. Insects: butterflies, in garden and field.
    3. Animals: in the parks; at the circus.
    4. Tadpole, frog.

II. Plant Life.
    1. Home and school gardens.
        a. Vegetable seeds: bean, corn, radish, lettuce.
        (Note: Seeds may be obtained from the Department of Agriculture at Washington).
    2. Flowers.
        a. Identification of most common wild flowers.
        b. Observation of unopened buds, and of changes.
    3. Trees.
        a. Buds and blossoms; pussy-willow.

III. Weather Conditions.
    1. Spring signs.
        a. Days growing longer and warmer.
        b. Return of birds.
        c. April showers.
    2. Daily weather record.
    3. The sun.

IV. Physiology and Hygiene.
  1. Health talks.
    a. Bathing.
    b. Care of skin and hair.
    c. Care of mouth and teeth.
    d. Proper foods.

Standards of Attainment.

At the conclusion of this work, the children should be able to:

Identify a few of the common birds, flowers, and trees, and note their distinctive features.
Plant seeds, and care for a plant from seed to flower.
Identify color in nature.
Make simple reports of the effect of the sun.
Keep hands, faces, nails, and teeth clean.

Reference List.

Blanchon: Nature's Garden. (Doubleday Page and Co.).
Blanchon: Birds Every Child Should Know, (Doubleday Page and Co.).
Mathews: Familiar Flowers of Field and Garden, (D. Appleton and Co.).
McMurry: Lessons in Nature Study, (The Macmillan Co.).
Gross: The Play of Animals, (D. Appleton and Co.).
Burroughs: Squirrels and Other Fur Bearers, (Houghton Mifflin Co.).
Chase: Stories of Insects, (Educational Publishing Co.).
Ballard: Among Moths and Butterflies, (G. P. Putnam's Sons.).
Hemenway: How to Make School Gardens, (Doubleday Page and Co.).
Morley: Flowers and Their Friends, (Ginn and Co.).
Wilson: Nature Study: A Manual for Teachers, (The Macmillan Co.).
Schwartz: Wilderness Babies, (Little, Brown and Co.).
Gardner: Nature Stories, (The Macmillan Co.).
Weed: Seed Travellers, (Ginn and Co.).
Krackowizer: Projects in the Primary Grades, (J. B. Lippincott Co.).

Andrews: Botany All the Year Round, (American Book Co.).

Andrews: Stories Mother Nature Told Her Children, (Ginn and Co.).

Gibson: I Spy and Sharp Eyes, (Harper and Bros.).

Meier: Home and School Gardens, (Ginn and Co.).

Burgess: Bird Book for Children, (Little, Brown and Co.).

GEOGRAPHY.

Grade III A.

Time allotment: Seventy-five minutes per week for Geography and Nature Study.

Guide Topics: Observational or Out-of-Door Geography.

Introduction.

The ways in which we are fed, clothed, sheltered, and transported, furnish many geographical facts which in time become permanent possessions. The method of instruction should consist largely of discussions based upon direct observations gained through excursions and short field trips to study at close range the various typical features in the immediate environment. Observations in the street after a heavy rain and visits to places in the neighborhood may be instituted. Mere memory exercises are to be avoided. Oral reports, supplemented by crude sketches, are valuable.

Illustrative material, consisting of pictures and interesting suggestive articles, together with blackboard sketches and simple recordation of facts gained, are necessary. Reasonable use of the sand-table should be made. (Refer to the General Introduction of this Course for fuller treatment of this topic).

Textbook: California State Series Introductory Geography, in the hands of the teacher.

Outline of Work.

I. Seasonal Changes.
  1. Affecting life of pupil.
    a. Games.
    b. Food.
    c. Clothing.

  2. Affecting occupations of people.
    a. In the home.
    b. In garden and field preparatory to approach of winter.
  3. Affecting animal life.
    a. Preparation by animals for winter.
    b. Migration of birds—those which stay all winter; those which migrate; why and where?
  4. Affecting vegetation.
    a. Trees having leaves first to turn.
    b. Trees that lose their leaves.
    c. Evergreen trees.

II. Surface Features.
  1. Type forms of land and water in neighborhood. (Develop through field trips).

III. Maps.
    a. Of schoolroom. (Pupils to point to symbol for their own seats, teacher's desk, window, and other objects).
    b. Direction.
    c. Points of compass.

IV. Occupations and Industries of the Community.
  1. Agriculture.
    a. The farm or market garden.
    b. The dairy.
  2. Commerce.
    a. As growing out of the needs and wants of people.
    b. Transportation: modes and means.
    c. Markets.
  3. Trade and exchange.
    a. Among early pioneers.
    b. Of the neighborhood and of the rural districts.
    c. San Francisco as a trading center.

Reference List.

Fairbanks: Home Geography for Primary Grades. (Mimeographic).

McMurry: Excursions and Lessons in Home Geography, (The Macmillan Co.).

Payne: Geographical Nature Studies, (American Book Co.).

Dodge: Home Geography and World Relations, (Rand, McNally and Co.).

Tarr and McMurry: First Book in Geography, (The Macmillan Co.).

Frye: New Geography, Book One, (Ginn and Co.).

Brigham and McFarlane: Essentials of Geography, First Book, (American Book Co.).

Redway and Hinman: Natural Elementary Geography, (The Macmillan Co.).

Fairbanks: Stories of Mother Earth, (Educational Publishing Co.).

Chamberlain: How We are Clothed, (The Macmillan Co.).

Chamberlain: How We are Sheltered, (The Macmillan Co.).

Chamberlain: How We Travel, (The Macmillan Co.).

Carpenter: How the World is Fed, (American Book Co.).

Carpenter: How the World is Clothed, (American Book Co.).

Carpenter: How the World is Sheltered, (American Book Co.).

Herbertson: Man and His Work, (Adam and Charles Black, London).

Werthner: How Man Makes Markets, (The Macmillan Co.).

Frye: Brooks and Brook Basins, (Ginn and Co.).

Nida: Letters of Polly, the Pioneer, (The Macmillan Co.).

Murché: Science Reader, Book I, (The Macmillan Co.).

GEOGRAPHY.

GRADE III B.

Time allotment: Seventy-five minutes per week for Geography and Nature Study.

Guide Topics: Observational or Out-of-Door Geography: Regional Geography.

Introduction.

(Read carefully the Introduction to the Three A Grade Geography Course).

Outline of Work.

I. Seasonal Changes.
  1. Observational work on seasonal changes, (continued), watching their effect upon the occupations of the people, animals, and vegetation.

II. Weather Conditions.
  1. Observation of weather changes.
    a. Winds that give warm weather with clouds and rain.
    b. Winds that give clearing weather.
    c. Weather chart: noting date, appearance of sky, kind of day, and direction of wind.
  2. The sun.
    a. Position at nine o'clock, at twelve o'clock, at two o'clock.
  3. Rain.
    a. Effects on fields and gardens.
    b. Effects on streets, gutters, and catch basins.
    c. Protection against rain: of children, houses, streets, and roads.

III. Surface Features.
  1. Type water forms: springs, wells, streams, rivers, bays, oceans.

IV. Maps.
  1. Of vicinity of school, (to gain clear ideas of location and direction).

V. Observational Geography.
  1. Comparison of the local environment with others.
  2. Roads.
    a. Beginnings of roads: roads of animals, Indian trails, the blazed trail, branching roads, and cross-roads; names of highways.
    b. Need of good roads: by the farmer: by the merchant.
    c. City streets: need of paving; sidewalks; lighting.

VI. Regional Geography.
  1. San Francisco.
    a. Landmarks.
      (1). Hills, (Russian, Telegraph, Twin Peaks, etc.).
      (2). Churches.
      (3). Other important buildings.

- b. Principal streets, (Mission, Market, Montgomery, Kearny, Geary, Van Ness Avenue, Lincoln Way, Funston Avenue, etc.).
- c. Large factories, (box, cracker, mattress, can, iron works, etc.).
- d. Points of interest, (Parks, Museums, Sutro Heights, Mint, Civic Center, etc.).
- e. Water front, (Fisherman's Wharf, coal docks, lumber docks, transport docks, etc.).
- f. Transportation facilities.
  - (1). Street car lines. (Imaginary or real trips, to the business section, Chinatown, through Stockton St. and Twin Peaks Tunnels, etc.).
  - (2). Auto-bus lines.
  - (3). Aeroplanes.
- g. Industries and commerce. (Studied through imaginary or real trips, and interchange of commodities).

2. Bay Counties.
   - a. Location.
   - b. Natural features.
   - c. Principal occupations.
   - d. Products and their interchange.
   - e. Chief cities.

Reference List.

Refer to the list given for the Three A Grade Geography Course.

NATURE STUDY.

Grades III A and III B.

Time allotment: Seventy-five minutes per week for Nature Study and Geography.
Guide Topics: Animal life; plant life.

Introduction.

The purpose of the work of this Grade is to direct the child's attention to the fact that each thing in life depends on some other thing for its existence, and to continue the study of birds, flowers, animals, and trees, so as to secure information as well as to establish identification.

Outline of Work.

Fall Term: Nature Study, Physiology and Hygiene.

I. Animal Life.
   1. Pets: animals and birds.
   2. Caterpillars. (Observation in the class room: feeding; watching change to chrysalis, to butterfly).
   3. Bees: honey-storing. (Plants most useful to bees).
   4. Humming birds,—habits; and usefulness.
   5. Earth-worms,—their usefulness.
   6. Fish seen in the market.

II. Food. (How obtained).
   1. Milk.
   2. Cream.
   3. Butter.
   4. Bread.
   5. Sugar.
   6. Meat.
   7. Salt.

III. Physiology and Hygiene.

Good health based on cleanliness, proper food, and care of body.

Standards of Attainment.

At the conclusion of this work the children should be able to:

Tell the steps in the life of a butterfly.

Recognize and name the common fish found in the markets.

Tell sources of milk, cream, bread, sugar, meat, and salt.

Identify a few of the common birds and insects.

Spring Term: Nature Study, Physiology and Hygiene.

I. Plant Life.
   1. Soil and its preparation for planting.
   2. Seed planting. (In different kinds of soil, noting results).
   3. Garden plants.
   4. Vines: ivy, honeysuckle, grape, clematis, morning-glory, sweet-pea.
   5. Dependence of plants on sun, light, and heat.
   6. Trees. (Collecting leaves and small branches of eucalyptus, acacia, and willow).

II. Animal Life.
  1. Study of pets, (continued).
  2. Insects.
    a. Those helpful to the farmer,—lady-bug, etc.
    b. Those destructive to plant life,—scale insects; slugs; snails.
  3. Animals which destroy insects.
    a. Lizards, (habits).
    b. Toads.
    c. Frogs.
    d. Spiders.

III. Physiology and Hygiene.
  1. Importance of correct posture, (sitting, standing, etc.).
  2. Continuation of health talks. (Care of eyes, ears, nose, etc.). "Emphasize that hygiene is more than personal; it is social." (S. F. Course of Study, 1915).

Standards of Attainment.

At the conclusion of this work, the children should be be able to:

Tell what a plant must have to make it grow.
Identify soil, (sand, clay, gravel).
Make and care for a vegetable garden.
Identify some of the common vines and garden flowers.
Identify the trees, birds, and insects mentioned in the Course thus far.

Reference List.

Bailey: Practical Garden Book, (The Macmillan Co.).
Bailey: Garden Making, (The Macmillan Co.).
Hodge: Nature Study; and Life, (Ginn and Co.).
Murche: Science Reader, Book I, (The Macmillan Co.).
Wilson: Nature Study: A Manual for Teachers, (The Macmillan Co.).
Morley: Seed Babies, (Ginn and Co.).
Bass: Animal Life, (D. C. Heath and Co.).
Carter: Nature Study with Common Things, (American Book Co.).
Bass: Plant Life, (D. C. Heath and Co.).

Wright: Seaside and Wayside, (D. C. Heath and Co.).

Weed: Seed Travellers, (Ginn and Co.).

Gould: Mother Nature's Children, (Ginn and Co.).

Johannot: Little Friends of Feathers and Furs, (American Book Co.).

Comstock: Handbook of Nature Study, (Comstock Publishing Co.).

Comstock: The Spider Book, (Comstock Publishing Co.).

Payne: Geographical Nature Studies, (American Book Co.).

Jackman: Field Work in Nature Study, (Flanagan and Co.).

Cummings: Nature Study by Grades, (American Book Co.).

Williams: Lessons in Nature, Vol. II, (Educational Publishing Co.).

Krackowizer: Projects in the Primary Grades, (J. B. Lippincott Co.).

Bryant: How to Tell Stories to Children. (Houghton Mifflin Co.).

Comstock: The Spider Book,

Needham: Natural History of the Farm, (Comstock Publishing Co.).

Keefer: Nature Studies on the Farm, (American Book Co.).

Frye: Brooks and Brook Basins, (Ginn and Co.).

Burgess: Bird Book for Children, (Little, Brown and Co.).

GEOGRAPHY.

Grade IV A

Time allotment: Ninety minutes per week for Geography and Nature Study.

Guide Topic: Home, or Out-of-Door Geography, Maps, Models, and Globe; California Geography.

An intensive study of the special surface features in the immediate environment, with the characteristic industries, should be made in this Grade. (Refer to the General Introduction of this Course for further treatment of this phase of the work).

This is the time in which to fix the facts of place geography, not by learning lists arbitrarily, but by establishing the map habit. A proper understanding of maps is secured by teaching pupils to represent on a map the special surface features observed during their excursions, or other features already well known to them. An excellent pictorial interpretation of maps is given in Figure 91, Introductory Geography. Pupils should be taught to make maps of the class room, school yard, and immediate vicinity. Maps may be drawn, or may be modeled in sand, clay, and putty. All map work should be supervised closely by the teacher.

The topical outline of California Geography indicates the larger points only. The teacher should use Fairbanks' "The New Geography, Book I", constantly, for development of the large headings.

Textbook for reference: California State Series Introductory Geography, pages 1 to 66.

Outline of Work.

A. Home or Out-of-door Geography, (Continuous throughout the term).

I. Seasonal Changes.

1. Observation of sun's apparent path across the sky; time of sunrise and sunset,—with consequent varying length of day and night.
2. Winter, the coldest, shortest day, December 21; low sun, very slanting rays, long shadows.
3. Summer, the warmest, longest day June 21; high sun, rays nearly vertical, shadows short.
4. Spring and autumn, mild days and nights nearly equal, (March 21 and September 21).

II. Weather Conditions.

1. Observation of winds once a week, leading children to learn that change in direction of wind causes change in weather, and indicating that wind bears a definite relation to state of sky, temperature, and precipitation.
2. Summary at end of month relative to general weather onditions, prevailing winds, temperature, and change in length of day.

III. Surface Features: Type forms in the neighborhood, and industrial pursuits.

1. Plains: characteristic features; drainage; soil conditions; industrial activities: farming, truck gardening, (community), grazing, (Western plains).
2. Hills and valleys; rolling land and plains contrasted; drainage; soil conditions; occupation of people.
3. Mountains: appearance of hills in surrounding country; appearance of moutains; size; uses—as summer resorts, for mining, lumbering, and water supply.
4. Lakes and rivers; origin; outlets; salt lakes, uses—water supply, food supply, ice, highways, resorts along shores.

B. Topical Outline of California Geography. (Based on Fairbanks' "The New Geography, Book I".).

1. Why do we learn about our California home first?
2. The world must be very large.
3. The world is the home of many kinds of living things.
4. Our homes are of many different kinds, and in many different places.
5. Our California land offers every sort of home that one could wish.
6. We must make our home where our work calls us.
7. Why is it so difficult to make homes in some parts of California?
8. Where does the water come from?
9. How water rules our lives.
10. The rains do not always come when needed.
11. Too much rain is as bad for us as not enough rain.
12. A land where little rain falls is a desert.
13. We could no more get along without the sun than without water.
14. How we depend upon the soil.
15. How the slopes of the land determine the kind of work that we shall do.
16. What can we learn from an excursion along the sea shore?
17. What a river and its valleys have to tell us.
18. What can we learn from a journey through the mountains?
19. Why is the country the best place for a home?
20. Life in a city has disadvantages.
21. Every city was once a little village.
22. Where would you start a village if you wanted it to become a manufacturing city?

23. If you wished to visit a friend living some miles away how could you learn the way to his home?

C. Maps, Models, and Globe.

1. A map is very different from a picture.
2. How do we make plans, maps, and models?
3. From some high point near the school we will compare the country in sight with a map of the same.
4. The model will help us to learn about a river system.
5. What can we learn about a river basin from the map?
6. Maps tell us much about homes in different parts of California.
7. We will make a model of California and study it.
8. Some things which we have learned about the wind, the rain, and the sunshine will help us, with the aid of the model, to tell much about the climate of our State.
9. After we have learned something of the *surface* of California from the model, we can then make good use of a map.
10. What brought our grandfathers to California, and by what routes?
11. How do people now reach their homes in different parts of California?
12. Why is our State spending so much money building highways?
13. How is it that we depend so little upon people of other countries for our food supplies?
14. How is it that we raise in California such a great variety of products?
15. How is it that California has become so noted for its fruits?
16. In what manner do we dispose of the great quantities of product grown in California?
17. Why are the people of the East so glad to get our products?
18. What foods used in your home are not produced in California?
19. What can we learn about other countries from the products they send us?
20. What leads us to believe that the world is large and that it contains many countries whose people, animals, and plants are unlike ours?

21. Although you may never travel far over the great world, you can learn much about the different countries and how their people live by studying your own home.
22. How do we know the earth is not flat as it appears to be?
23. How does the behavior of the sun teach us that the earth is round?
24. The behavior of the sun also teaches us that the earth moves.
25. The position of the stars at different times also tells us that the earth moves.
26. The sun is the chief maker of the different climates that people enjoy over the earth.

Reference List.

National Geographic Magazine, 31: 549-564: Mothers of All Lands, Pictures.

Russell: Rivers of North America, (G. P. Putnam's Sons.).

Dodge and Kirchwey: Teaching of Geography, (Rand, McNally and Co.).

Tarr and McMurry: New Geography, Book One, (The Macmillan Co.).

Brigham and McFarlane: Essentials of Geography, First Book, (American Book Co.).

Redway and Hinman: Natural Elementary Geography, (The Macmillan Co.).

Frye: New Geography, Book One, (Ginn and Co.).

Dodge: Home Geography and World Relations, (Rand, McNally and Co.).

Dodge: Elementary Geography, (Rand, McNally and Co.).

McDonald and Dalrymple: Little People Everywhere, (Little, Brown and Co.). (Holland, Japan, India, Mexico, Scotland, Ireland).

Chance: Little Folks of Many Lands, (Ginn and Co.).

Chance: Children of the World, (Educational Publishing Co.).

Smith: Holland Stories, (Rand, McNally and Co.).

Shillig: Four Wonders: Cotton, Wool, Silk, Linen, (Rand McNally and Co.).

Andrews: Seven Little Sisters, (Ginn and Co.).

Andrews: Each and All, (Ginn and Co.).

Campbell: Story of Little Jan, the Dutch Boy, (Educational Publishing Co.).

Campbell: Story of Little Conrad, the Swiss Boy, (Educational Publishing Co.)..

Carroll: Around the World, (Silver, Burdett and Co.). Book I. Eskimos, Indians, Arabs, Dutch, Chinese, Japanese. Book II. Russia, India, Egypt, Scotland.

Campbell: Story of Little Mitzu, the Japanese Boy, (Educational Publishing Co.).

Schwatka: The Children of the Cold, (Educational Publishing Co.).

Nida: Letters of Polly, the Pioneer, (The Macmillan Co.).

Kirby: Aunt Martha's Corner Cupboard, (Henry Altemus).

Grover: Overall Boys in Switzerland, (Rand, McNally and Co.).

Grover: Sunbonnet Babies in Holland, (Rand, McNally and Co.).

Finnemore: Peeps at Many Lands, (The Macmillan Co.).

Yonge: Little Lucy's Wonderful Globe, (The Macmillan Co.).

Shaw: Big People and Little People of Other Lands, (American Book Co.).

Lane: The Wide World, (Ginn and Co.).

Peary: The Children of the Arctic, by the Snow Baby and Her Mother, (Fred Stokes Co.).

Miller: Little People of Asia, (E. P. Dutton and Co.).

Morris: Home Life in All Lands, Book I, (Lippincott and Co.).

Winslow: The Earth and Its People, (D. C. Heath and Co.).

Chaplin: Little Folks of Other Lands, (Lothrop, Lee and Shepard).

Carpenter: Around the World with the Children, (American Book Co.).

Thompson: Fil and Filippa, (The Macmillan Co.).

Mitchell: Paz and Pablo, (The World Book Co.).

George: Little Journey Series, (Flanagan and Co.)

Allen: Children of the Palm Land, (Educational Publishing Co.).

Botsford: Child Life in All Nations, (American Book and Bible House, Philadelphia, 1901).

Dunton: School Children the World Over, (Fred Stokes Co., 1909).

Miln: Little Folks of Many Lands, (John Murray, London).

Schwartz: Five Little Strangers, (American Book Co.).

Mirick and Holmes: Home Life Around the World, (Houghton Mifflin and Co.).

Perdue: Child Life in Many Lands, (Rand, McNally Co.).

Walter: Peeps at the World's Children, (The Macmillan Co.).

Perkins: The Twin Books, (Houghton Mifflin Co.). Eskimo; Dutch; Mexican; Irish; Japanese; French.

Starr: Strange People, (D. C. Heath and Co.).

Whittum: Little Folks of Far Away Lands, (Educational Publishing Co.).

McMorris: Our Little Cousin Series, (L. L. Page Co.). Eskimo, Australian, Mexican, Belgian, Hawaiian, Arabian, Philippine, Hindu, Canadian, Persian, African, Chinese, Panamanian, Alaskan, Japanese, Finnish.

Du Chaillu: The Land of the Long Night, (Charles Scribner's Sons).

Froelicher: Swiss Stories and Legends, (The Macmillan Co.).

Campbell: Wah Sing, Our Little Chinese Cousin, (Educational Publishing Co.).

Bealby: Peeps at Many Lands, (The Macmillan Co.).

Reynolds: How Man Conquered Nature, (The Macmillan Co.).

Bassett: Story of Lumber, (The Macmillan Co.).

Bassett: Story of Wool, (The Macmillan Co.).

Bond: With Men Who Do Things, (Munn).

Bond: Pick, Shovel, and Pluck, (Munn).

Brooks: Story of Cotton, (Rand, McNally and Co.).

Chase and Clow: Stories of Industry, (Educational Publishing Co.).

Cooke: Day in an Iron Works, (Doran).

Cooke: Day in a Ship Yard, (Doran).

Cooke: Visit to a Coal Mine, (Doran).

Cooke: Visit to a Cotton Mill, (Doran).
Cooke: Visit to a Woolen Mill, (Doran).
Cooke: A Day With Leather Workers, (Doran).
Crissey: The Story of Foods, (Rand, McNally and Co.).
Rocheleau: Great American Industries, (Flanagan and Co.).
Rocheleau: Manufactures, (Flanagan and Co.).
Rocheleau: Minerals. (Flanagan and Co.).
Rocheleau: Products of the Soil, (Flanagan and Co.).
Rocheleau: Transportation, (Flanagan and Co.).
Wade: Our Little Cousin Series, (L. C. Page Co.).
Our Little Cuban Cousin, Our Little Philippine Cousin, Our Little Hawaiian Cousin, Our Little Brown Cousin.
Chamberlain: How We Are Fed, (The Macmillan Co.).
Chamberlain: How We Are Clothed, (The Macmillan Co.).
Chamberlain: How We Are Sheltered, (The Macmillan Co.).
Chamberlain: How We Travel, (The Macmillan Co.).
Carpenter: How the World Is Fed, (American Book Co.).
Carpenter: How the World Is Clothed, (American Book Co.).
Carpenter: How the World Is Housed, (American Book Co.).
O'Kane: Jim and Peggy at Meadow Brook Farm, (The Macmillan Co.).
Werthner: How Man Makes Markets, (The Macmillan Co.).
Mulets: Sunshine Lands of Europe, (World Book Co.).
Luther: Trading and Exploring, (American Book Co.).
Miller: Little People of Asia, (E. P. Dutton and Co.).
Starr: Strange Peoples, (D. C. Heath and Co.).

GEOGRAPHY.

Grade IV B.

Time allotment: Ninety minutes per week for Geography and Nature Study.

Guide Topics: Journey Geography; The Earth as a Whole, or Globe Studies.

Introduction.

(Read carefully the Introduction to the 4 A Grade Geography Course).

In the 4 B Grade the work of the 4 A Grade is continued. (The numerals under A below follow consecutively those given under C in the 4 A Grade Course.) Having concluded a thorough study of California, the young pupil is led into a study of the earth as a whole. This is intended in the main to give him a bird's eye view of those parts of the earth that are brought to his attention through story-telling and reading. The outline furnishes a guide to such a study. The work is not to be conducted intensively, but is to be directed toward the awakening of an interest that will carry over into the geography studies of the upper grades. It should be an interesting teaching course rather than one focused upon a test examination.

Textbook: California State Series Introductory Geography, pages 119 to 149.

A. Journey Geography. (Based on Fairbanks' "The New Geography, Book I".) (Not to exceed two months' work.)

27. We learn from our California home that the sun is aided by other conditions in making the climates that people enjoy in different places.
28. What are the chief things that our journeys have taught us?
29. What advantages has our State for trade with other countries?
30. What disadvantages did we have to overcome before we could ship our products over our own United States?
31. Trace on the globe the ocean voyage that was once necessary to go by water from New York to San Francisco.
32. Why is the Panama Canal of such great advantage to the people of California?
33. Why has San Francisco greater advantages for commerce and manufacturing than any other city of the Pacific Coast?
34. Trace on the globe the different routes by water from San Francisco to England.
35. Why cannot we carry on commerce with England around the North of our continent?

36. What do we receive from the different countries of Europe in exchange for our products?
37. If you ordered a shipload of dates from Arabia, show upon the globe the route you would have the ship take.
38. Starting west from San Francisco trace the shortest way around the world by water.
39. Visit the wharves of San Francisco and observe what the boats are bringing from distant lands beyond the ocean.
40. Why is it that we have so little trade with Africa?
41. What are the most important products that we ship from California by water?
42. What were the chief shipments during the early Spanish days?
43. How is it that with each succeeding year we are becoming more independent of other lands?
44. There are some necessities with which California does not supply us.
45. There could be no trade with people of other lands if we did not need some of their products.

B. The Earth as a Whole, or Globe Studies.

I. The Earth. (Studied from maps and globe). (Not to exceed four weeks' work).

1. Form.
2. Size.
3. Land and water divisions.
4. The axis and the poles.
5. The equator.
6. Day and night.
7. Zones.
8. Climate.

II. The Continents.—North America, South America, Europe, Asia, and Australia. (Studied from maps and globe). (Not to exceed eight weeks' work).

1. Form.
2. Chief mountain ranges.
3. Chief river systems.
4. Boundary waters.
5. Climate.
6. Leading products.
7. People.
8. Animals.

Questions and Problems.

1. If you start from your home and travel about the world eastward, what bodies of land would you pass over?
2. If you were to travel westward, what bodies of land and water would you cross?
3. Starting from your home in a northerly direction and traveling around the earth, which way would you go?
4. What bodies of land and water would you cross?
5. Starting in a southerly direction and traveling about the earth, what bodies of land and water would you cross?
6. What oceans might we cross in traveling from North America to Eurasia?
7. Which one would you cross if you were going to Europe from North America?
8. Which ones in going to Asia?
9. Name the bodies of water surrounding each continent.
10. In what direction is each continent from North America?
11. What continents are crossed by the equator?
12. Which of the continents is the warmest?
13. If you were to cross the ocean from North America to Europe, in which hemisphere would you be?
14. Look at the globe to see if you can divide the earth into land and water hemispheres.

Reference List.

Refer to the Reference List given for the Four A Grade Geography Course.

NATURE STUDY.

Grades IV A and IV B.

Time allotment: Ninety minutes per week for Nature Study and Geography.

Guide Topics: Animal Life; Plant Life; Weather Conditions.

Introduction: Read carefully the General Introduction of this Course.

Outline of Work.

Spring Term: Nature Study, Physiology and Hygiene.

I. Animal Life on the Farm.
  1. Domestic animals.
    a. Horse, cow, pig. (Study of any two as to mouths; food; habits; uses).
    b. Cat, dog, rabbit. (Study of any two as to food; teeth; covering; habits; defense).
  2. Wild animals. (Study of any two).
    a. Squirrel, (tree and ground), cotton-tail, jack-rabbit.
    b. Fox, coyote, snake, gopher.
  3. Birds.
    a. Chicken and duck.
    b. Blue-jay, hawk, owl, buzzard, eagle, woodpecker.
  4. Fish.
    a. Salmon, trout.
    b. Crab, oyster, shrimp.

II. Plant Life on the Farm.
  1. Fruit tree,—fruit; nuts.
  2. Oak and its acorns.
  3. Redwoods, (giant and coast).
  4. Douglass fir, (called "Oregon pine").
  5. Uses of trees, (lumber; wind breaks).

III. Physiology and Hygiene.
  1. Mastication of food; manner and times of eating; wholesome food.
  2. Need of exercise.
  3. Danger from fire. (Care of burns).

Standards of Attainment.

At the conclusion of this work, the children should be able to:

Identify the common animals and birds named in the Course.
Tell of the habits of these animals and birds.
Identify oak, redwood, pine trees, and their wood.
Tell the common uses of each.
Maintain a proper standard of cleanliness.

Spring Term: Nature Study, Physiology and Hygiene.

I. Weather Conditions.
  1. Various kinds of clouds. (How formed).
  2. Record of weather observations.

3. Clouds which bring rainy, cloudy, and fair weather. (Observation and record).
4. Movement of moisture from ocean to cloud and return to ocean.
5. Effect of weather conditions upon garden and farm; too much moisture or drought.

II. Plant Life on the Farm, (continued).
  1. Wild flowers.
    a. Names.
    b. Parts.
    c. Care.
  2. Potato, (cut properly, and plant in earth and water), potato bug.
  3. Cabbage; cabbage-beetle.
  4. Grains,—oats, barley, rice and corn: uses. (Have pupils plant grains, watch growth, and learn to recognize the various kinds).
  5. Trees.
    a. Structure and functions of the different parts of the tree: the roots and root hairs; trunk with the heart-wood, sap-woods, inner and outer bark; branches and twigs, buds, leaves, fruits, flowers, and seeds.
    b. Forest: forest floor, undergrowth, and canopy; effect on rainfall; value and uses of the forest; care and preservation; government reservations.
    c. Enemies of the forest: winds; fire; man; insects; moths; caterpillars; gall-nuts.
    d. Friends of the forest: foresters; birds.

III. Insects.
  1. Fly eggs, larva or maggot, pupa. (Study the breeding places of flies).
  2. Ants: habits; nests; at home; at war; as carpenters.

IV. Physiology and Hygiene.
  1. General sanitation.
  2. Conditions fostering growth of flies and mosquitoes.

Standards of Attainment

At the conclusion of this work, the children should be able to:

Identify the various clouds.

Make simple records of weather observations.
Explain evaporation and rain.
Identify the most common wild flowers.
Explain the functions of the different parts of the tree.
Identify the enemies and friends of the forest.
Appreciate the dangers from flies and mosquitoes.
Act intelligently toward their extermination.

Reference List.

Furneaux: Life in Ponds and Streams, (Longmans, Green, and Co.).
Weed: Insects, (Ginn and Co.).
Miller: First Books of Birds, (Houghton Mifflin Co.).
Stokes: Ten Common Trees, (American Book Co.).
Murche: Science Reader, Book II, (The Macmillan Co.).
Wilson: Nature Study; A Manual for Teachers, (The Macmillan Co.).
Johonnot: Friends in Feathers and Furs, (American Book Co.).
Kelly: Leaves From Nature's Story Book, (Educational Publishing Co.).
Comstock: Handbook of Nature Study, (Comstock Publishing Co.).
Jackman: Field Work in Nature Study, (Flanagan and Co.).
Rogers: Trees Every Child Should Know, (Grosset and Dunlap).
Davison: Health Lessons, Book II, (American Book Co.).
Krackowizer: Projects in the Primary Grades, (J. B. Lippincott Co.).
Morley: Grasshopper Land, (A. C. McClurg and Co.).
Gray: How Plants Grow, (American Book Co.).
Dana: How to Know the Wild Flowers, (Charles Scribner's Sons.)
Tappan: The Industrial Readers, (Houghton Mifflin Co.).
    Book I. The Farmer and His Friends.
    Book II. Diggers in the Earth.
    Book III. Makers of Many Things.
    Book IV. Travelers and Traveling.
Needham: Natural History of the Farm, (Comstock Publishing Co.).
Keefer: Nature Studies on the Farm, (American Book Co.).
Burgess: Bird Book for Children, (Little, Brown and Co.).

GEOGRAPHY.

Grade V A.

Time allotment: One hundred twenty minutes per week for Geography and Nature Study.

Guide Topic: California.

Introduction.

In this Grade, for the first time in the Course, the problem method, in its simpler forms, is introduced. The most important aim to be accomplished at this point through this method should be that of bringing the pupil to grasp the relationship of cause and effect. (See the General Introduction for details of method.)

The Outline of Work deals with California Geography, following closely the topics of Fairbanks' text, "The New Geography, Part II", copies of which are to be supplied to the pupils. The teacher is to instruct the pupil to use the textbook effectively. The Introductions at the opening of Chapters in the Fairbanks, and the Summaries, Review Exercises, and Practical Lessons at the conclusions of Chapters have great value, and are to be given special attention.

The wisdom of devoting a year to the study of California geography may be called in question; hence, a brief explanation for such a disposition of time and material is considered desirable. The philosophy underlying the plan followed in this Course may be stated thus: that a thorough study of causal relationships on the scale of California geography will lead to a much better understanding of such relationships and, consequently, to a reduction of effort and time when knowledge so fixed is applied to the United States as a whole, and to foreign countries. In other words, California, in this case, is an expanded type study. It is thought, also, that such a study ought to bear fruit in a greater appreciation by the Californian of the wonderful State in which he lives.

Outline of Work.

Topical Outline of the Geography of California.
(Based on Fairbanks' "The New Geography, Book II").

Chapter I.

I. California, a land of gold.
II. California, a land of fruitful gardens.
III. Early California, the home of the Indian.
IV. Early California, the home of the Spaniard.

Chapter II.

I. The main routes by which the pioneers reached California.

II. Difficulties presented by the California Coast to the early explorers.

III. Difficulties encountered by the pioneers in reaching the mines.

IV. Effect of climate on the settlement and development of California.

Chapter III.

I. The natural resources of our California garden.

II. Conservation of the natural resources of our California garden.

III. Effects on the growth of California of the character of its surface, its streams, and its climate.

IV. Attraction of California's wonderful scenery.

V. Thoughts on the study of California geography, with reference to its importance, and to its division into seven natural districts or provinces.

Chapter IV.

I. The Great Valley, the granary and future garden of California.

Reference and Supplementary Reading List.

National Geographic Magazine, 28: 57-99, July, 1915, The Wonderland of California.

Fairbanks: The Western United States, (D. C. Heath and Co.).

Southworth and Kramer: Great Cities of the United States, pages 227 to 245, (Iroquois Publishing Co.).

Overland, 64:495, Cotton in California.

National Parks Folio, (Department of the Interior, Washington, D. C.).

Booklets issued by Counties, and by City Chambers of Commerce.

Railroad folders, etc.

Jacobs and Blanchard: Joan's California Summer, (Jacobs, Philadelphia).

Carroll: Around the World, Third Book, (Silver, Burdett and Co.).

GEOGRAPHY.

Grade V B.

Time allotment: One hundred twenty minutes per week for Geography and Nature Study.
Guide Topic: California.

Introduction.

(Study carefully the Introduction to the V A Grade Course in Geography).

Outline of Work.

Topical Outline of the Geography of California, (Continued).

(Based on Fairbanks' "The New Geography, Book II").

Chapter V.

I. The Coast Ranges: general characteristics.

II. The Northern Coast Ranges, the home of the giant redwoods.

III. The Clear Lake District, a pleasant land of mineral springs and health resorts.

IV. The Southern Coast Ranges, a land of comfortable homes.

V. San Francisco Bay and surrounding region, the gateway to California.

Chapter VI.

I. The Sierra Nevada Mountains: their great importance.

Chapter VII.

I. Southern California, the land of orange groves.

Chapter VIII.

I. The Great Basin, the strange land east of the Sierras.

Chapter IX.

I. The Klamath Mountains, the natural boundary between California and Oregon.

Chapter X.

I. The Volcanic Plateau, an elevated region of broad, plain-like valleys, lava fields, and extinct volcanoes in northeastern California.

Reference and Supplementary Reading List.

(See the list for the V A Grade Geography Course).

NATURE STUDY.

Grades V A and V B.

Time allotment: One hundred twenty minutes per week for Geography and Nature Study.

Guide Topics: The Air; Water; Plant Life; Birds; Insects.

Introduction.

Read carefully the General Introduction to Elementary Science in this Course of Study. The basal reference book for these Grades is Murche's "Science Readers, Book III." Material bearing upon the particular topics has been assembled to secure greater continuity in the work. Jewett's "Health and Safety" will supply additional material upon the topics outlined, and will serve to supplement the Course wherever needed.

Outline of Work.

Fall Term: Nature Study, Physiology and Hygiene.

I. The Air. (Murche's "Science Readers, Book III", Lessons, XXVI, XXVIII, and X).

1. Ventilation.
2. Uses.
3. Breathing of plants and animals.
4. Vapor in the air.
5. Wind-mills,—use.

II. Water. (Murche, Lessons I, II, VI, VII, IX, XIII, XIV, XVII, XVIII).

1. Properties; uses; as a solvent.
2. Forms,—steam, water vapor, fog or mist, dew, rain, ice, hail, snow, frost.

III. Plant Life. (Murche, Lessons XLVI, XLVIII, L, LI, LII).

1. Parts.
2. Leaves,—parts; uses; needs; change of color; why they fall.
3. Roots,—uses.
4. Need of water. (Experiment to show this).
5. Need of light. (Experiment to show this).
6. Flowers,—parts.

IV. Seeds. (Murche, Lessons LIII, LIV, LV, LVI).
  1. Kinds,—winged; hairy, etc.
  2. Seed pods.
  3. Carrying of seeds,—by wind; by birds. (Note dandelion seeds, maple, and mistletoe).

V. Birds.

(List familiar birds, and note chief distinguishing features).

VI. Physiology and Hygiene.
  1. The teeth.
    a. Kinds.
    b. Structure,—wrong uses.
    c. Cleaning teeth,—brush, powder.
    d. Dentistry and treatment of teeth.
    e. Chewing of foods.

Standards of Attainment.

At the conclusion of this work, the children should be able to:

Understand the necessity for breathing pure air.
Tell about the different forms of water, and their uses.
Tell about the parts of a plant and their uses.
Identify some of the common seeds.
Tell how nature distributes them.
Take proper care of the teeth.

Spring Term: Nature Study, Physiology and Hygiene.

I. Birds. (Murche, Lessons III, IV, V, VIII, XI, XII, XV, XVI).
  1. Feathers,—uses.
  2. Bones, beaks, legs, and feet.
  3. Nests,—where built; shapes.

II. Insects. (Murche, Lessons XLI, XLIII, XLV).
  1. Butterfly,—metamorphosis, egg, larva, chrysalis.
  2. Beetle; blue-bottlefly; grasshopper.
  3. Bees; honey-bee.
    a. Observation of bees among the flowers.
    b. Hive; flowers from which bees collect honey.
    c. Hornets and wasps.
    d. Value of bees to gardeners and fruit growers.

III. The Spider. (Murche, Lessons XLVII, XLIX).
  1. Body; eyes; legs.
  2. Web.

IV. Fish. (Murche, Lessons, XXXIII, XXXV, XXXVII, XXXIX).
   1. Gills; scales; use of tail.
   2. Food; teeth; etc.

V. The Frog. (Murche, Lessons XXV, XXVII, XXIX).
   1. Home; food; how it breathes.
   2. Comparison with toad.
   3. Life history.

VI. Physiology and Hygiene. (Select material from Jewett's "Health and Safety", Chapters I, II, V, IX, XI, XII, XIII, XVIII, XIX, XX, XXI, XXII, XXVIII, and XXIX, in so far as time will permit).

Standards of Attainment.

At the conclusion of this work, the children should be able to:

Recognize and classify birds as to their beaks and feet.
Tell the life history of the butterfly; of the bee.
State a few general facts about the spider, the frog, and the fish.
Understand the necessity for proper food and establish habits for daily caring of hair and nails.

Reference List.

Sharp: The Whole Year Round, (Houghton Mifflin Co.).
Bailey: Beginners' Botany, (The Macmillan Co.).
Bailey: First Lessons With Plants, (The Macmillan Co.).
Rowell: Science for the Fifth Grade,
Overton and Hill: Nature Study, (American Book Co.).
Fairbanks: Stories of Our Mother Earth, (Educational Publishing Co.).
School Classic: Flower Friends, (Educational Publishing Co.).
Kelly: Leaves from Nature's Story Book, (Educational Book Co.).
Gould: Mother Nature's Children, (Ginn and Co.).
Long: Wood Folk at School, (Ginn and Co.).
Prince Ghosh: Wonders of the Jungle, (D. C. Heath and Co.).

Kirby: The Sea and Its Wonders, (Nelson and Son.).
Comstock: Handbook of Nature Study, (Comstock Publishing Co.).
Dutton: Fishing and Hunting, (American Book Co.).
Dutton: In Field and Pasture, (American Book Co.).
O'Shea and Kellogg: Health and Cleanliness, (The Macmillan Co.).
Fall: Science for Beginners, (World Book Co.).
O'Shea and Kellogg: Health Habits, (The Macmillan Co.).
Ingersoll: Wild Neighbors, (The Macmillan Co.).
Parsons: Wild Flowers of California, (H. S. Crocker Co.).
Wheelock: Birds of California, (McClurg.).
Trafton: The Teaching of Science, (Houghton Mifflin Co.).
Payne: Manual Experimental Botany, (American Book Co.).
Keeler: Bird Notes Afield, (Paul Elder and Co.).
Burgess: Bird Book for Children, (Little, Brown and Co.).

GEOGRAPHY.

Grade VI A.

Time allotment: One hundred-forty minutes per week for Geography and Science.

Guide Topics: Europe, (as a whole); North America, (as a whole); The United States, (as a whole); The United States in Sections.—The New England States.

Introduction.

The preceding year's study of California geography should now provide a basis for comparisons and contrasts with Europe and the United States in sections. The amount of time to be given to each continent or subdivision of a continent should depend largely upon the importance of the given region in relation to the United States.

The few broad problems and projects herein presented form the basis of work for the teacher's guidance, but are not planned to exclude the introduction of material not given in the Outline of Work. They are designed to be centers of organization taking the place of a multitude of minor points and unrelated facts. Detail has therefore been omitted in order to allow of fuller consideration of large units of instruction.

The problems and projects illustrate the method of treatment of the subject-matter. There should be a conscious uniformity of treatment which should lead to a steady continuity of thought running through many lessons, and connecting closely from grade to grade.

(For further material on this topic, consult Dodge and Kirchwey, Chapter IV).

In the presentation of the various phases of the work, it is absolutely necessary for teachers to use the globe and maps at all times. Relief, rainfall, and product maps —for which consult the textbook and supplemental books, particularly Rabenort's "United States as a Whole" and Frye's "New Geography—Book One",—have special value, and must be employed constantly in the work of this Grade.

For further development of this point, refer to the General Introduction to this Course, and to Dodge and Kirchwey, pages 86 to 92.

Textbook: California State Series, Advanced Geography, pages 314 to 325, and 1 to 66. Supplemental books should be used freely.

Outline of Work.

Latitude and Longitude.

(Not to exceed one week's work).

EUROPE AS A WHOLE.

(Not to exceed four weeks' work).

(Those teaching the geography of Europe will find Fairbanks' "Topical Outline of the Geography of Europe" helpful.)

The reason for taking up the Study of Europe at this point is to provide a suitable geographical background for the History of this Grade. It is not intended to be an exhaustive study. General Problem: To determine the reasons for the great importance of Europe in the history of the world.

Specific Problems or Projects.

To find the natural advantages of Europe.

For solution consider:

1. Position as centre of land hemisphere.
2. Temperate climate.
3. Proportion of lowlands to mountainous areas.
4. Large river systems.
5. Extent and irregularity of coast-line.
6. Natural resources.

To determine why Europe has so many independent countries with different languages.

To note why Europe is grouped with Asia under the term "Eurasia."

To make a comparison between Europe and North America.

For solution consider:

1. Latitude.
2. Climate.
   a. Temperature.
   b. Rainfall.
3. Position of highlands and effects upon rainfall.
4. Size and population, (see appendix to textbook).

(Note: Upon the completion of this study, the pupil should be able to sketch from memory a five-minute map showing the chief mountains, river systems, oceans and seas, and principal seaports, or to write in such items on a map furnished him).

North America As A Whole

(Not to exceed four weeks' work).

General Problem: To find why North America is one of the leading continents of the World.

Specific Project.

To determine the prominent features of North America.

For solution consider:

1. Origin and geological history of the continent.
2. Position, form, and extent.
3. Coast line.
4. Surface.
   a. Atlantic Coastal Plains.
   b. Appalachian Mountains.
   c. Great Central Plain.
   d. Rocky Mountains.
   e. Great Plateau.
   f. Pacific Coast Lowlands.

(Note: This study of surface on a regional basis should show what influence the natural boundaries, extent, special characteristics, and climatic conditions of each region have had upon the plant and animal life, the activities of the people, and the transportation routes).

5. Drainage.

(Note: The prominent rivers of each region should be studied and the pupils be taught to trace the watersheds).

6. Climatic conditions.
7. Plants, animals, and people, (in a general way).
8. Political divisions.

The United States As A Whole.

As preliminary to the consideration of the general problem and specific problems or projects below make a basal study of:

1. Location, including latitude and longitude.
2. Size and extent.
3. Surface and drainage.
4. Climate, including rainfall.
5. Natural resources.

General Problem: To determine the great importance of the United States in the history of the world.

Specific Problems or Projects.

To account for the wonderful growth of the United States in population.

For solution consider:

1. Population in 1790, and at present date.
2. Importation of negroes.
3. Immigration.

To account for the wide distribution of population.

For solution consider:

1. Distribution in 1790, and at present date.
2. Ports of entry.
3. Attractions of various Sections.
    a. Agricultural.
    b. Industrial.
    c. Commercial.
    d. Climatic.

(Note: Upon the completion of this study, the pupils should be able to point on the map to any state named, or to name any state pointed to on the map).

The United States in Sections.

Preliminary Suggestions of Method.

Preliminary Suggestions of Method.

During the study of the United States by Sections, the pupils are to be taught to classify the important products under three heads:

1. Those which we produce in excess of our needs, as grain and cotton.
2. Those of which we produce not enough for our needs, as sugar and rice.
3. Those of which we produce none, as tea, coffee, and rubber.

The individual product maps of the United States are to be made and studied first in connection with the New England Section, and are to be extended as each new Section is studied.

Map reading is to be continued, and location by parallels and meridians.

The use of the scale is to be encouraged, the pupils being taught to notice that the scale varies from map to map, and that, therefore, relative sizes of countries cannot be determined by merely comparing maps. Pupils should make comparisons as to relative distances, with books open.

They should note how surface features affect commerce, how natural resources have determined the occupations peculiar to the Section studied and have influenced the development of its trade centers, and how climatic conditions favor the growth of certain products.

Each Section is to be studied from the problem point of view.

(For further development of these suggestions, refer to Dodge and Kirchwey, Chapter VI).

Outline of Work.

The New England States.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as shown in the text-book, under Figure 47, and a preliminary basal study of:

1. Location, including latitude.
2. Surface and drainage.
3. Climate.

General Problem: To determine the contribution of the New England States toward making the United States so great a nation.

Specific Problems or Projects.

To determine why the States of this Section are extensively engaged in lumbering, and related industries.

For solution consider:

1. Presence of dense forests.
2. Facilities for establishing saw-mills.
3. Facilities for shipment of the products.
4. Demand for the products.

(For a further development of the topic "Lumbering," refer to Dodge and Kirchwey, pages 238-240).

To determine why the States of this Section are extensively engaged in quarrying.

1. Presence of granite, marble, and slate in large quantities.
2. Easy transportation.
3. Demand for these materials.

To determine why fishing is a profitable industry of the States of this Section.

For solution consider:

1. Abundance and excellence of fish and other ocean-foods in adjacent waters.
2. Possibilities of canning, drying, and salting.

To determine why the states of this Section have not devoted themselves extensively to agriculture.

For solution consider:

1. Rocky and uneven land.
2. Poor soil in many parts.
3. Extremes of climate.

To determine why the States of this Section have devoted themselves so extensively to manufacturing.

For solution consider:

1. Abundance of water-power.
2. Relative cheapness of coal for developing power.
3. Proximity to good harbors.
4. Well-developed systems of waterways, railroads, and steamship lines.
5. Accessibility to foreign markets.

To determine what advantages the States of this Section enjoy for engaging in commerce.

For solution consider:

1. Easy access to other points of the United States, and to Canada.
2. Well-located ports for coastwise and foreign trade.

To determine how and why the States of this Section engage extensively in commerce.

For solution consider:

1. Necessity of bringing in raw material.
2. Necessity for shipment of natural products and manufactured goods.

To determine in an intensive study the reasons for the great size and importance of Boston.

(For a type lesson on "Cities", refer to Dodge and Kirchwey, page 96).

To note briefly six other important cities of the States of this Section, the states in which they are located, and the reasons for their importance. (Refer to the Appendix of the text-book).

To locate on an outline-map of the States of this Section the following items: chief mountains, rivers, cities, and state boundaries. (These maps may be five-minute sketch maps made by the pupils, or be mimeographed copies furnished them).

To take imaginary trips to places of special interest, such as those to

A maple sugar camp.
A fish cannery.
A marble quarry.
A shoe factory.
A watch factory.
Boston: Bunker Hill, Old South Church, Fanueil Hall.
Cambridge: Harvard University.
New Haven: Yale University.

Reference List.

(See the Reference List for the 4th Grade).

Travel Magazine (McBride).

National Geographic Magazine.

Geography News Bulletin, (Prepared weekly by the National Geographic Society).

Keller and Bishop: Commercial and Industrial Geography, (Ginn and Co.).

Rocheleau: Geography of Commerce and Industry, (Educational Publishing Co.).

Sutherland and Sanford: Practical Exercises in Geography, Our Own Country and Her Possessions, Book One, (Silver, Burdett and Co.).

Brigham and McFarlane: Essentials of Geography, Second Book, (American Book Co.).

Sutherland and Sanford: New Geography, Second Book, (The Macmillan Co.).

Rabenort: United States as a Whole, (American Book Co.).

Rabenort: North America, (American Book Co.).

Rabenort: United States by Groups and by States, (American Book Co.).

Fairbanks: Western United States, (D. C. Heath and Co.).

Frye: New Geography, Book One, (Ginn and Co.).

Wiswell: Globes and Maps, A Teacher's Manual, (Rand, McNally and Co.).

Tarr and McMurry: New Geography, Book II, (The Macmillan Co.).

Rocheleau: Great American Industries, Products of the Soil; Minerals, Manufactures, (Flanagan and Co.).

Todd: The World's Cotton Crops, (The Macmillan Co.).

Edgar: Story of a Grain of Wheat, (D. Appleton and Co.).

Wilkinson: Story of the Cotton Plant, (D. Appleton and Co.).

Smith: Our Own Country, (Silver, Burdett and Co.).

Bean: On the Wool Track, (John Lane Co., N. Y.).

Freeman and Chandler: The World's Commercial Products, (Ginn and Co.).

Bengston and Griffiths: The Wheat Industry, (The Macmillan Co.).

Willcox: Great Cities in America, (The Macmillan Co.).

Gaye: Great World's Farm, (The Macmillan Co.).

Ibbetson: Tea, (Sir Isaac Pitman and Sons, London.).

Twombly and Dana: The Romance of Labor, (The Macmillan Co.).

Southworth and Kramer: Great Cities of the United States, (Iroquois Publishing Co.).

Chamberlain: The Continents and Their People. North America, (The Macmillan Co.).

Reynolds: How Man Conquered Nature, (The Macmillan Co.).

Greene: Coal and Coal Mines, (Houghton Mifflin Co.).

Werthner: How Man Makes Markets, (The Macmillan Co.).

Ingersoll: Knocking Around the Rockies, (The Century Co.).

Allen: Geographical and Industrial Studies of the United States, (Ginn and Co.).

Lummis: A Tramp Across the Continent, (Charles Scribner's Sons.).

Winslow: Geographical Readers, (D. C. Heath and Co.).

Winslow: United States, (D. C. Heath and Co.).

George: Little Journeys to Other Lands, (Flanagan and Co.).

Carpenter: North America, (American Book Co.).

Roosevelt: The Winning of the West, (G. P. Putnam's Sons.).

Johnson: New England, A Human Interest Geographical Reader, (The Macmillan Co.).

Mulets: Sunshine Lands of Europe, (World Book Co.).

Fisher: Resources and Industries of the United States, (Ginn and Co.).

Kipling: Captains Courageous, (The Century Co.).

Lane: Industries of To-day, (Youth's Companion Series, Ginn and Co.).

Tappan: The Industrial Readers, (Houghton Mifflin Co.).

Book I. The Farmer and His Friends.
Book II. Diggers in the Earth.
Book III. Makers of Many Things.
Book IV. Travelers and Traveling.

Brooks: The Story of Corn, (Rand, McNally and Co.).

Brooks: The Story of Cotton, (Rand, McNally and Co.).

Myrick: American Sugar Industry, (Orange, Judd Co., N. Y.).

Thompson: From the Cotton Field to the Cotton Mill, (The Macmillan Co.).

Chase and Clow: Stories of Industry, (Educational Publishing Co.).
Book I. Minerals.
Book II. Clothing and Food.
Crissey: The Story of Foods, (Rand, McNally and Co.).
Bassett: Story of Wool, (Pennsylvania Publishing Co.).
Bassett: Story of Lumber, (Pennsylvania Publishing Co.).
Curtis: Story of Cotton, (Pennsylvania Publishing Co.).
Samuel: Story of Iron, (Pennsylvania Publishing Co.).
Samuel: Story of Gold and Iron: (Pennsylvania Publishing Co.).
Cooke: Day in an Iron Works, (Doran.).
Cooke: Day in a Ship Yard, (Doran.).
Cooke: Visit to a Coal Mine, (Doran.).
Cooke: Visit to a Cotton Mill, (Doran.).
Cooke: Visit to a Woolen Mill, (Doran.).
Cooke: Day with Leather Workers, (Doran.).
King: The Land We Live In, (Lee and Shepard.).
King: This Country of Ours, (Lee and Shepard.).
Wilkinson: Story of the Cotton Plant, (D. Appleton and Co.).
Hotchkiss: Representative Cities of the United States, (Houghton Mifflin Co.).
Smith: North America, (The Century Co.).
Smith: Commerce and Industry, (Henry Holt and Co.).
Myrick: Book of Corn, (Orange, Judd Company, New York.).
Dodge: Hans Brinker, a Story of Life in Holland, (Charles Scribner's Sons.).
Kunz: Moni, The Goat Boy, (Ginn and Co.).
Spyri: Heidi, (Ginn and Co.).
Ward: Climate, (G. P. Putnam's Sons).

ELEMENTARY SCIENCE.

Grade VI A.

Time allotment: One hundred forty minutes per week for Science and Geography.

Guide Topic: The Air and How We Use It.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's "The Science of Everyday Life", pages 1 to 34, in the hands of the teacher, supplemented by Murche's "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction, and the Suggestions to Teachers, in the Van Buskirk and Smith.

Outline of Work.

Project I. The Air a Real Substance.

1. Air is real.
2. Problems, pages 4 to 8, inclusive.
3. Topics, pages 8 to 20.
    a. Three forms of matter.
    b. The atmosphere and its pressure.
    c. The barometer,—its construction and uses.
    d. Air pressure and pumps.
    e. Air pressure and the action of the siphon.
    f. Pressure of the air upon the human body.
    g. Structure of the human ear.
    h. Sound,—its nature, transmission, and rate of travel.
    i. Compressed air; liquid air.
    j. Balloons and aeroplanes.
4. Individual projects, page 20.

Project II. Air and Fire.

1. Fire in its relation to our lives.
2. Problems, pages 22 to 26.
3. Topics, pages 26 to 33.
    a. A fire needs air.
    b. Composition of the air.
    c. Burning decreases the amount of oxygen in the air.
    d. Burning increases the amount of carbon dioxide and water in the air.
    e. Elements and compounds.
    f. Oxidation.
    g. Matches.
    h. Matter may be changed in form but can not be destroyed.
4. Individual projects, page 33.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

GEOGRAPHY.

Grade VI B.

Time allotment: One hundred-forty minutes per week for Geography and Science.

Guide Topic: The United States in Sections, (continued): The Middle Atlantic States; The Southern States; The Central States; The Western States.

Introduction.

(Study carefully the Introduction to the 6 A Grade Geography Course).

When studying one Section, comparisons are to be drawn with other Sections previously studied, with a view to accentuating similarity or contrast, and to attaining a perspective of the United States as a whole.

Map reading, and location by parallels, are to be continued.

The use of the scale should be emphasized, having the pupils notice that the scale varies from map to map, and that therefore relative sizes of countries can not be determined by merely comparing maps. The pupils are to make comparisons as to relative distances, with books open. They should be afforded opportunities to note how surface features affect commerce, how natural resources have determined the occupations peculiar to the Section studied and have influenced the development of the trade centers, and how climatic conditions favor the growth of certain products.

Each Section is to be studied from the problem point of view, following the same general plan of treatment as for the New England States in the Grade VI A Geography Course.

There should be close correlation at all points with the Course of Study in History.

Textbook: California State Series, Advanced Geography, pages 67 to 176. Supplemental books should be used freely.

Outline of Work.

The Middle Atlantic States.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as shown in the textbook under Figure 62, and a preliminary basal study of:

1. Location, including latitude.
2. Surface and drainage.
   - a. Coastal plains.
   - b. The "fall-line" and its importance.
   - c. The Alleghany Plateau.
   - d. Passageways across the Appalachian Mountains.
   - e. Glacial action and its effects.
   - f. Sinking of the coast and its effects.
3. Climate.

General Problem: To determine the contribution of the Middle Atlantic States toward making the United States so great a nation.

Specific Problems or Projects.

To determine why lumbering and its related industries are of importance in the States of this Section.

To determine why fishing is a prominent industry of the States of this Section.

For solution consider:

1. Kinds of fish.
2. Oyster industry.

To determine why the States of this Section devote themselves more extensively to agriculture than do the New England States.

For solution consider:

1. Location of farms.
2. Dairying.
3. Tobacco-raising.
4. Fruits and vegetables.
5. Other farm products.

To determine why mining is one of the leading industries of the States of this Section.

For solution consider:

1. Salt.
2. Coal.
3. Oil and gas.
4. Iron ore.

Illustrative Type Lesson: Oil.

1. Origin of petroleum.
2. History of discovery of oil.
3. Locating of wells.
4. Kind of wells.
    - a. Gushers.
    - b. Pumpers.
5. Methods of storing crude oil.
6. Methods of transportation.
7. Centers for refineries.
8. Refining of petroleum.
9. Use of kerosene.
10. By-products and common uses.
11. Importance of gasoline.

(In a similar manner the topics "coal," "gas," and "iron" may be developed).

To determine why manufacturing is carried on so extensively in the States of this Section.

For solution consider:

1. The iron and steel industry.
2. Glass, pottery, cement, and bricks.
3. Other kinds of manufacturing.

To determine what advantages the States of this Section enjoy for engaging in commerce.

For solution consider:

1. Harbors.
2. Connections with the interior.
    - a. Waterways.
    - b. Railroads.

To determine how and why the States of this Section engage extensively in commerce.

For solution consider:

1. Necessity of bringing in raw material.
2. Necessity for shipment of natural products and manufactured goods.

To determine in an intensive study the reasons for the great size and importance of the following cities of the States of this Section: New York, Philadelphia, Pittsburg, Baltimore, and Washington.

(For a type lesson on "Cities", refer to Dodge and Kirchwey, page 96).

To locate on an outline-map of the States of this Section, the following items: Chief mountains, rivers, cities, and state boundaries.

(These maps may be five-minute sketch maps, made by the pupils, or be mimeographed copies furnished them).

To note briefly five other important cities of the States of this Section, the States in which they are located, and the reasons for their development. (Refer to the Appendix of the textbook).

To take an imaginary journey starting at Washington and proceeding down the Chesapeake Bay north to New York, thence by the Hudson River and the Erie Canal to Buffalo, noting the chief points of interest.

To take imaginary trips to places of special interest, such as

A coal mine.
A coke oven.
A steel plant.
A silk factory.
An oyster bed.
Washington city: the Capitol, the White House, the Congressional Library, the Washington Monument, the Corcoran Art Gallery.
Great universities.

The Southern States.

Preceding the consideration of the general problem and specific problems or projects below make a study of map-questions as shown in the textbook under Figure 87, and a preliminary basal study of:

1. Location, including latitude.
2. Surface and drainage,
   - a. Resemblance of the northeastern part to the Middle Atlantic Section.
   - b. Level character of greater part of this Section.
   - c. Location of the mountains.
   - d. Comparative regularity of the coastline.
3. Climate.

General Problem: To determine the contribution of the Southern States towards making the United States so great a nation.

Specific Problems or Projects.

To determine why lumbering and its related industries are of great importance in the States of this Section.

For solution consider:

1. Kinds of trees, and their uses.
2. Method of lumbering.
3. Turpentine and tannic acid.

To determine why fishing is an important industry in the States of this Section.

For solution consider:

1. Abundance of fish in surrounding waters.
2. Kinds of fish.
3. Oyster fishing.
4. Sponge and turtle fishing.

To determine why the States of this Section devôte themselves more extensively to agriculture than do the New England and the Middle Atlantic States.

For solution consider:

1. Cotton.
    a. Relation to slavery.
    b. Climate required.
    c. Method of raising and marketing.
    d. Quantity produced.

(For further development of the topic "cotton," refer to the type-lesson in Dodge and Kirchwey, pages 57 and 58).

2. Rice.
    a. Importance as a food.
    b. Method of cultivating, and preparation for market.

(For further development of the topic "rice," refer to Sutherland and Sanford's "Practical Exercises in Geography, Book I," pages 41 to 44).

3. Sugar and by-products.
    a. The plant from which derived.
    b. Conditions favorable to growth of the plant.
    c. Method of cultivation.
    d. Method of converting juice into raw sugar.
    e. Method of refining.
    f. Molasses.

(For further development of the topic "sugar," refer to Sutherland and Sanford's "Practical Exercises in Geography, Book I", pages 38 to 41).

4. Tobacco.
5. Fruits.
6. Other farm products.

To determine why ranching is an important occupation in Texas.

(For method of development, refer to Dodge and Kirchwey, page 51).

To determine why mining is one of the leading industries of the States of this Section.

For solution consider:

1. Coal.
2. Iron.
3. Oil and gas.

(See illustrative type-lesson "oil" under "Middle Atlantic States" in this Course, above).

4. Salt and phosphates.

To determine why manufacturing has advanced in importance so rapidly of recent years in the States of this Section.

For solution consider:

1. Forests and their by-products.
2. Abundant and contiguous supplies of coal and iron.
3. Abundant local supply of cotton and other raw materials.
4. Improved labor conditions.
5. Discovery of oil.

To determine what advantages the States of this Section enjoy for engaging in commerce.

For solution consider:

1. The Mississippi River and its tributaries.
2. Easy access to New England and Middle Atlantic States, and to European manufacturing centers.
    a. Atlantic ports.
    b. Gulf ports.
3. Railways.

To determine by what routes cotton would probably be sent from the States of this Section to New England, or Europe.

To determine in an intensive study the reasons for the great size and importance of the following cities of the States of this Section: New Orleans, Memphis, Birmingham, and Atlanta.

To note briefly six other important cities of the States of this Section, the States in which they are located, and the reasons for their development. (Refer to the Appendix of the textbook).

To locate on an outline-map of the States of this Section the following items: chief mountains, rivers, cities, and state boundaries. (These maps may be five-minute sketch maps made by the pupils, or be mimeographed copies furnished to them).

To take imaginary trips to places of special interest, such as

A cattle ranch.
A cotton plantation.
A rice field.
A cane sugar plantation.
An oil well.
A steel mill.

To note how the products and industries of the States of this Section vary from those of the New England States and the Middle Atlantic States.

The Central States.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as shown in the textbook under Figure 104, and a preliminary basal study of:

1. Location, including latitude.
2. Surface and drainage.
   a. Great extent of level land.
   b. Treeless plains.
3. Climate.
   a. Temperature, with reasons for the extremes.
   b. Rainfall.

General Problem: To determine the contribution of the Central States toward making the United States so great a nation.

Specific Problems or Projects.

To determine why agriculture is the most important industry of the States of this Section.

For solution consider:

1. Wheat.
   a. Extent to which raised.
   b. Methods of cultivation.
   c. Methods of harvesting.
   d. Uses.

  - e. Marketing of surplus product.
  - f. Influence upon growth of cities.

2. Corn.

(Develop as for "wheat" above. Refer also to McMurry's "Type Lessons and Study Plans," Vol. 1, No. 2, and to Sutherland and Sanford's "Practical Exercises in Geography, Book I." pages 96 to 100).

3. Stock-raising.
   - a. Kinds and their distribution.
   - b. The Blue Grass Region of Kentucky.
4. Vegetables and fruit.
5. Other farm products.

To compare and contrast a Kansas or Nebraska ranch with a Kentucky, Ohio, or Missouri farm.

Illustrative Type Lesson: A Ranch.

1. Extent.
2. Location of house and corrals.
3. Lack of fences.
4. Object of first "round-up" and method of accomplishing it.
5. Second "round-up" and its results.
6. Life of the ranchman.

To determine why the States of this Section devote themselves to lumbering quite extensively.

For solution consider:

1. Extent.
2. Kinds of trees.
3. Methods of lumbering.
4. Centres for distribution.
5. By-products.

To determine why fishing is of minor importance in the States of this Section.

To determine why mining is one of the leading industries of the States of this Section.

For solution consider:

1. Petroleum and natural gas.
2. Coal.
   - a. Wide distribution.
   - b. Kinds.
   - c. Methods of mining.
3. Iron-ore.

4. Copper.
    a. Location and extent.
    b. Methods of mining.
    c. Uses.
    d. Commercial distribution.
    e. Value of product.
5. Lead.
6. Zinc.
7. Clays and limestone.

To determine why manufacturing is very extensively carried on in the States of this Section.

For solution consider:

1. Manufactures from agricultural products.
2. Manufactures from mineral products.

To determine what advantages the States of this Section enjoy for engaging in commerce.

For solution consider:

1. Abundance of natural products and manufactured goods.
2. Wonderful transportation facilities.
    a. Mississippi River and its tributaries.
    b. The Great Lakes. (Canals).
    c. Railroad systems.

To determine in an intensive study the reasons for the great size and importance of the following cities of the States of this Section: Chicago, St. Louis, Cleveland, Detroit, Milwaukee, Minneapolis, and Cincinnati.

Illustrative Type Lesson: Chicago.

1. Location.
2. Comparison between area and number of inhabitants.
3. Advantages of location for establishing a great commercial centre.
   (Use maps and pictures extensively).
4. Advantages for carrying on manufacturing on a large scale.
5. Chief industries.
6. Educational institutions.

To note briefly seven other important cities of the States of this Section, the States in which they are located, and the reasons for their development. (Refer to the Appendix of the textbook).

To locate on an outline-map of the States of this Section the following items: chief mountains, rivers, lakes, cities, and state boundaries. (These maps may be five-minute sketch maps made by the pupils, or be mimeographed copies furnished to them).

To determine with what products a vessel starting from Duluth for New York would be laden, what would be its course, and with what it would be laden for the return voyage to Duluth.

(Similarly, to undertake a trip by water from Minneapolis to New York).

To take imaginary trips to places of special interest, such as

The Mammoth Cave.
A copper mine.
A round-up.
A sawmill.
A flour mill.
An automobile factory.
Great universities.

The Western States.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as shown in the textbook under Figure 131, and a preliminary basal study of:

1. Location, including latitude.
2. Surface and drainage.
    a. The three mountain ranges.
    b. The valleys between.
    c. The volcanoes and their influence.
3. Climate.
    a. Arid and semi-arid region.
    b. Well-watered region.
        (1). Northwestern Coast.
        (2). Higher plateaus and the mountains.
    c. Oases.

General Problem: To determine the contribution of the Western States towards making the United States so great a nation.

Specific Problems or Projects.

To determine why this region is one of the most important mining districts of the world.

For solution consider:

1. Gold.
2. Silver.
3. Copper.
4. Lead.
5. Mercury.
6. Oil.
7. Coal.

Illustrative Type Lesson: Gold.

1. Location of mines and deposits.
2. Noted mining districts.
3. Methods of mining.
    - a. Panning.
    - b. Hydraulic.
    - c. Quartz.
4. Uses.

To determine why the States of this Section devote themselves extensively to lumbering and its related products.

For solution consider:

1. Special demand from mining industry.
2. Extent.
3. Location of forests.
4. Kinds of trees.
5. Methods of lumbering.
6. Uses.
7. By-products.
8. Forest reservations.

To determine why fishing is an important industry in the Pacific Northwest States of this Section.

For solution consider:

1. Salmon catching.
2. Halibut fishing.

To determine why agriculture is carried on extensively in the semi-arid and well-watered regions of the States of this Section.

For solution consider:

1. Wheat.
2. Barley.
3. Alfalfa.
4. Fruits and nuts.
5. Cattle and sheep raising.
6. Sugar beets.
7. Vegetables and other farm products.

To compare and contrast an irrigated orchard in California with a farm in Illinois.

To determine why manufacturing is an important industry in the Pacific States of this Section.

For solution consider:

1. Lumber.
2. Fish-canning.
3. Fruit-canning.
4. Flour.
5. Sugar-refining.
6. Ship-building.
7. Petroleum refining.

To determine what opportunities the States of this Section have for engaging in commerce.

For solution consider:

1. Abundance of raw materials and manufactured goods.
2. Need for importation of other manufactured goods, especially in mountain region.
3. Wonderful transportation facilities.
    a. Transcontinental railroads.
    b. Fine harbors on Pacific Coast.

To note how the products and industries of the States of this Section vary from those of the States of the Atlantic, Southern, and Middle Sections.

To note the scenic wonders of the States of this Section.

For solution consider:

1. Yellowstone National Park.
2. Grand Canyon of the Colorado River.
3. Glacier National Park.
4. Yosemite National Park.
5. Sequoia National Park.

To determine in an intensive study the reasons for the importance of the following cities of the States of this Section: San Francisco, Los Angeles, Seattle, Denver, Portland, and Salt Lake City.

To note briefly six other chief cities of the States of this Section, the States in which they are located, and the reasons for their importance. (Refer to the Appendix of the textbook).

To locate on an outline-map of the States of this Section the following items: chief mountains, rivers, large adjacent waters, cities, national parks, and state boundaries. (These maps may be five-minute sketch maps made by the pupils, or be mimeographed copies furnished to them).

To take imaginary or real trips to places of special interest, such as

The home of the Cliff-dwellers.
Yosemite Valley.
Pike's Peak.
Yellowstone Park.
Crater Lake.
The Grand Canyon.
Mt. Hood; Mt. Rainier; Mt. Shasta.
A redwood grove.
A fish cannery on the Columbia.
A gold mine.
A cotton plantation in the Imperial Valley.
A wheat ranch.
An oil-well in California.
A sawmill.
An orange grove.
A prune orchard.
A beet sugar factory.
Great universities.

Reference List.

See the Reference List for the Six A Grade Geography Course.

ELEMENTARY SCIENCE.

Grade VI B.

Time allotment: One hundred forty minutes per week for Science and Geography.

Guide Topic: The Air and How We Use It.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's "The Science of Everyday Life," pages 34 to 67, in the hands of the teacher, supplemented by Murchés "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction and the Suggestions to Teachers in the Van Buskirk and Smith.

Outline of Work.

Project III. Air and Breathing.

1. All plants and animals breathe.
2. Problems, pages 34 to 40.
3. Topics, pages 40 to 48.
    - a. Activity and the rate of breathing.
    - b. Heat production and the rate of breathing.
    - c. Air we breathe in; breathe out.
    - d. Breathing of plants.
    - e. Human body a machine.
    - f. Cells, building units of living body; their parts; number in a living body; in the blood.
    - g. Tissues and organs.
    - h. The lungs and deep breathing; artificial respiration.
    - i. Oxidation in the cells of the body.
    - j. What becomes of the waste matter.
4. Individual projects, page 48.

Project IV. Air and Health.

1. Fresh air.
2. Problems, pages 51 to 53.
3. Topics, pages 54 to 66.
    - a. Factors which control ventilation.
    - b. Temperature, water vapor, and foreign material of the air.
    - c. Air and disease.
    - d. Enemies of health.
    - e. Bacteria—how they enter and attack the body.
    - f. How bacteria increase.
    - g. The external and internal defenses of the body.
    - h. The antitoxin treatment for diphtheria.
    - i. Bacteria present in healthy people.
    - j. Importance and method of keeping the body in a healthy condition.
    - k. Effects of alcohol and tobacco.
    - l. Seasons in relation to prevalence of disease.
    - m. Some ways in which bacteria are spread.
    - n. How to care for the sick.
    - o. Antiseptics and germicides.
    - p. What the community can do to prevent illness.
4. Individual projects, pages 66 and 67.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

GEOGRAPHY.

Grade VII A.

Time allotment: One hundred-eighty minutes per week for Geography and Science.

Guide Topics: Territories and Dependencies of the United States; Other Countries of North America; General Geography.

Introduction.

The few broad problems and projects herein presented form the basis of work for the teacher's guidance, but are not intended to exclude the introduction of additional material upon topics not given in the Outline of Work. They are designed to be centres of organization taking the place of a multitude of minor points and unrelated facts. Detail has, therefore, been omitted in order to allow of fuller consideration of large units of instruction.

The problems and projects illustrate the method of treatment of the subject-matter. There should be a conscious uniformity of treatment which should lead to a steady continuity of thought running through many lessons, and connecting closely from grade to grade.

The teacher should read carefully Dodge and Kirchwey's "The Teaching of Geography", pages 47 to 56.

In the presentation of the various phases of the work, it is absolutely necessary for teachers to use the globe and maps at all times.

In the study of "General Geography" in this Grade, the large facts of wind, rainfall, and climate are to be carefully developed in simple fashion for each continent, as these facts determine largely the possible products and chief occupations, and, therefore, have a direct bearing upon the life of every individual. The teacher will find material of great value on this subject in Dodge and Kirchwey, page 61. Appropriate experiments should be conducted in the science classes.

Textbook: California State Series, Advanced Geography, pages 177 to 282. Supplemental books should be used freely.

Outline of Work.

Alaska.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as given in the textbook under Figure 157, and a preliminary basal study of

1. Location, including latitude, noting other countries in the same latitude.
2. Surface and drainage.
   - a. Mountains.
   - b. Effect of glaciers.
   - c. Sea-coast.
3. Climate.

General Problem: To determine the wisdom of the purchase of Alaska by the United States.

Specific Problems or Projects.

To determine the importance of the fishing industry of Alaska.

For solution consider:
1. Food fish.
2. Whaling.
3. Sealing.

To determine the importance of the mining industry of Alaska.

For solution consider:
1. Gold.
2. Copper.
3. Coal.
4. Other minerals.

To determine the prospects for the further development of the fishing, mining, and other resources of Alaska.

For solution consider:
1. Extent of resources.
2. Development of railroads.

To compare the size of Alaska with that of Texas, and California, and the length of the Yukon River with that of the Missouri River.

To determine the location and importance of the following cities: Sitka, Juneau, Seward, Skagway, Nome, and Fairbanks.

To take an imaginary journey on the Yukon River, or a tourist trip from Seattle through the Inland Passage.

The Virgin Islands.

General Problem: To determine the wisdom of the purchase of the Virgin Islands by the United States.

Cuba and Porto Rico.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as given in the textbook under Figure 163, and a preliminary basal study of

1. Location, including latitude.
2. Area and surface features.
3. Climate.
4. Inhabitants.

General Problem: To determine the relationship and the value of Cuba and Porto Rico to the United States.

Specific Problems or Projects.

To determine the reasons why the United States is interested in Cuba, and governs Porto Rico.

For solution consider:

1. History.
2. Problems of government.
3. Special value to the United States.

To determine the value of forests and minerals in these islands.

To determine the great importance of agriculture in these islands.

For solution consider:

1. Sugar cane.
   (For development of this topic, refer to the treatment of it in the Six B Grade Geography Course).
2. Tobacco.
3. Coffee; tea; cocoa.
4. Tropical fruits.
5. Spices.
6. Cattle.
7. Other raw products.

To determine why there is so little manufacturing in these islands.

To note briefly five important cities of the islands, and the reasons for their importance.

To give reasons why you would or would not like to live in Cuba, or Porto Rico.

To visit a pineapple orchard in Porto Rico.

The Panama Canal Zone.

General Problem: To determine the reasons why the United States was willing to spend so much time and money in building the Panama Canal.

Specific Problems or Projects.

To determine the length and terminal ports of the Canal.

To determine the cost, difficulties of construction, and the value of the Canal.

To trace by the aid of a map the route a ship would have taken from San Francisco to New York before the Canal was built; to trace the route a ship would take, and determine the number of miles that would be saved, from and to the same ports, if it passed through the Canal.

The Hawaiian Islands.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map questions as given in the textbook under Figure 172, and a preliminary basal study of

1. Location, including latitude.
2. Size and origin.
3. Surface and soil.
   a. Mountains.
   b. Volcanoes.
4. Climate.
5. People and government.

General Problem: To determine the value of the Hawaiian Islands to the United States.

Specific Problems or Projects.

To determine the great value of agricultural and other products in these islands.

For solution consider:

1. Sugar cane.
   (For the development of this topic, refer to the treatment of it in the Six B Grade Geography Course).
2. Coffee.
3. Tropical fruits.

4. Rice.
5. Tobacco.
6. Rubber.

To determine the strategic importance of these islands.

To compare the value of these islands with that of Cuba.

To note the two chief cities of the islands, and the reasons for their importance.

The Philippine Islands.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as given in the textbook under Figure 172, and a preliminary basal study of

1. Location, including latitude, in comparison with Cuba and the Hawaiian Islands.
2. Area and surface features.
3. Climate.
4. Acquisition by the United States.
    a. How?
    b. When?
5. Inhabitants.

General Problem: To determine in what ways the Philippine Islands have benefited by being under the control of the United States.

Specific Problems or Projects.

To determine the general impetus given to the industries of the islands.

For solution consider developments in the production and distribution of:

1. Hemp.
2. Tobacco.
3. Lumber; rattan.
4. Tropical fruits.
5. Rubber.
6. Vegetable oils.
7. Spices.
8. Rice.
9. Minerals.

Illustrative Type Lesson: Hemp.

1. Sources of supply.
    a. The hemp-plant.
    b. Other fibre plants.

2. Conditions required for cultivation.
    a. Soil.
    b. Climate.
3. Method of preparation for marketing
4. Uses.
    a. Ship-cordage.
    b. Canvas and tents.
    c. Cords and twine.
    d. Bags and cloth.

To determine the prospects for the further development of these and other resources of the islands.

To compare the value of these islands with that of the Hawaiian Islands.

To note the advantages of the city of Manila, and the reasons for its importance.

Guam and Samoa.

To determine the extent of the other possessions of the United States in the South Pacific, and to discover the reasons for their importance. (Refer to textbook, Figure 172).

Canada and Newfoundland.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as given in the textbook under Figure 178. and a preliminary basal study of

1. Location, including latitude.
2. Surface and drainage.
    a. Resemblance between Southern Canada and the Northern United States.
    b. Effect of the Great Glacier.
    c. Coast-lines.
3. Approximate area in comparison with that of the United States.
4. Climate.
5. People.

General Problem: To determine the importance of Canada as a colonial possession of Great Britain.

Specific Problems or Projects.

To determine the reasons why Canada, in spite of its vast resources, has developed so much more slowly than has the United States.

For solution consider:

1. Climate.
2. Large areas of rocky soil.
3. Lack of convenient supplies of coal and iron.

To determine the great value of the lumbering industry of Canada.

For solution consider:

1. Extent of forests.
2. Kinds of trees.
3. Method of lumbering.
4. Lumber-centres.
5. By-products.

To determine the great value of the fishing industry of Canada and Newfoundland.

For solution consider:

1. Food-fish.
2. Sealing.
3. Life of the Newfoundland fisherman.

To determine the great importance of agriculture and grazing in Canada.

For solution consider:

1. Wheat, oats, and barley.
2. Hardy fruits.
3. Stock-raising.

(Develop a product-map for Canada, similar to that already formed for the United States).

To determine the great importance of the mining industries of British Columbia and Yukon Territory, and of Ontario and Southeastern Canada.

For solution consider:

1. Gold and silver.
2. Coal.
3. Petroleum.
4. Nickel, cobalt.

To determine the advantages enjoyed by Canada for the development of commerce.

For solution consider:

1. Railroad lines.
2. Water transportation.
    a. Rivers.
    b. Lakes.
    c. Oceans.
    d. Hudson Bay.

To determine the extent and value of manufacturing in Canada.

To make an intensive study of the following chief cities of Canada: Montreal, Toronto, Ottawa, and Vancouver.

To note the location of five other cities of Canada, and the reasons for their importance.

To determine the reasons for a close industrial and commercial relationship between Canada and the United States.

1. Proximity and accessibility.
2. Language.
3. Climate.
4. Reserves of timber in Canada.
5. Furs, fish, and certain rare minerals from Canada.
6. Food products and manufactures from the United States.

To take an imaginary trip down the St. Lawrence River, stopping at Montreal and Quebec and noting matters of interest and importance; to take similarly a western trip over the Canadian Pacific to Vancouver.

Labrador and Greenland.

To determine how the people of Labrador and Greenland live.

Mexico.

Preceding the consideration of the general problem and specific problems or projects below, make a study of map-questions as given in the textbook under Figure 194, and a preliminary basal study of

1. Location, including latitude.
2. Area and surface features.
3. Climate.
   a. In coastal plain-belt.
   b. In arid plateau belt.
   c. In mountain belt.
4. Inhabitants.

General Problem: To determine the natural resources and economic possibilities of Mexico.

Specific Problems or Projects.

To determine the conditions of life in the different climatic belts.

To determine the chief products and industries of the different climatic belts.

For solution consider:

1. Agriculture and cattle-raising in the low or hot belt, and in the temperate belt.
   a. Coffee.
   b. Tobacco.
   c. Rubber.
   d. Indigo.
   e. Tropical fruits.

Illustrative Type Lesson: Coffee.

1. Conditions of growth.
   a. Climate.
   b. Soil.
2. Description of plant.
   a. Seeds.
   b. Berries.
3. Methods of cultivation.
   a. Seed beds.
   b. Transplanting.
   c. Leaf protection.
4. Picking of crop.
5. Preparation for market.
   a. Washing.
   b. Drying.
   c. Fanning.
   d. Grading.
   e. Packing.
6. Markets.

(For further material on this topic, see Bowman's "South America", pages 217 to 224, and Carpenter's "South America", page 257).

2. Mining in the mountain belt.
   a. Gold and silver.
   b. Oil.

To determine the reasons why, with all its wonderful resources, the development of Mexico has been retarded.

To determine the reasons for the great difference in the degree of civilization between the people of Mexico and the United States.

For solution consider the following conditions in Mexico:

1. Origin of people.
2. Ignorance and poverty of people.
3. Nature of ranch-life.
4. Scarcity of water.
5. Lack of railroads.

To determine the prospects of increased trade between Mexico and the United States.

To note the advantages of the following cities: Mexico City, Puebla, Guadalajara, Vera Cruz, Mazatlan, and Tampico, and the reasons for their importance.

Central America.

Preceding the consideration of the general problem and the specific problems or projects below, make a study of map-questions as given in the textbook under Figure 194, and a preliminary basal study of

1. Location, including latitude.
2. Area and surface.
3. Climate.
4. Inhabitants..

General Problem: To determine to what extent Central America resembles Mexico.

Specific Problems or Projects.

To determine the resemblance of topography between Central America and Mexico.

For solution consider:

1. Hot, moist, coastal lowlands.
2. Healthful, elevated interior.
3. Heaviest rainfall on the eastern coast.
4. Best harbors on the western coast.

To determine the resemblance of the civilization of Central America to that of Mexico.

For solution consider:

1. Products in corresponding belts.
2. Industries in corresponding belts.
3. Exports to the United States.

To determine the prospects of increased trade between Central America and the United States.

To make an imaginary visit to a Costa Rican coffee plantation.

To note the advantages of the following cities: San Salvador, New Guatemala, San Jose, Bluefields, Punta Arenas, and the reasons for their importance.

The Remaining West Indies.

To determine the location of the West Indies not already studied, the chief occupations of the people, and the principal products. (Refer to the textbook, Figure 163).

General Problem: To compare the largest four of these islands in area and population with New York State.

Bermuda Islands.

General Problem: To determine the location of the Bermuda Islands, the chief occupations of the people, and the principal products.

General Geography.

Preparatory to this phase of the work, the teacher should make a careful study of Dodge and Kirchwey's treatment, in "The Teaching of Geography", page 61 following.

General Problem: To determine the effects upon the individual of the grand principles governing the universe in which he lives.

Specific Problems or Projects.

To determine the effects of the earth's shape upon the life of the individual.

To determine the effects of the earth's motions upon the life of the individual.

For solution consider:

1. Seasons.
2. Zones.
3. Varying length of day and night.

To determine the conditions governing climate.

For solution consider:

1. Temperature.
2. Winds.
3. Rainfall.
4. Ocean currents.
5. Location and direction of mountain systems.

To determine the effect of climate upon the distribution of plants, animals, and man.

Reference List.

Travel Magazine. (McBride).

National Geographic Magazine.

Bulletin of the Pan-American Union.

Geographic News Bulletin. (Prepared weekly by the National Geographic Society).

Keller and Bishop: Commercial and Industrial Geography, (Ginn and Co.).

Rocheleau: Geography of Commerce and Industry, (Educational Publishing Co.).

Sutherland and Sanford: Practical Exercises in Geography; Our Own Country and Her Possessions, (Silver, Burdett and Co.).

Brigham and McFarlane: Essentials of Geography, Second Book, (American Book Co.).

Tarr and McMurry: New Geography, Book Two, (The Macmillan Co.).

Longmans: New School Atlas, (Longmans, Green and Co.).

Baedecker: Guide Book of Great Britain, (Charles Scribner's Sons).

Baedecker: Guide Book of Germany and of the Rhine, (Charles Scribner's Sons).

Rabenort: North and South America, (American Book Co.).

Fairbanks: Topical Outline of the Geography of Europe, (Harr Wagner Publishing Co.).

Martinez and Lewandowski: The Argentine in the Twentieth Century, (Charles Scribner's Sons).

Blaich: Three Industrial Nations, (American Book Co.).

Lock: Rubber and Rubber Planting, (Cambridge University Press).

Kelly: Egypt, (Black).

Buley: Brazil (northern); Brazil (southern), (D. Appleton and Co.).

Starr: Mustafa, the Egyptian Boy, (A. S. Barnes Co.).

Freeman and Chandler: The World's Commercial Products, (Ginn and Co.).

Chase and Clow: Industrial Studies, Volume Two, (Educational Publishing Co.).

Carson: Mexico, The Wonderland of the South, (The Macmillan Co.).

Taylor: Boys of Other Countries, (G. P. Putnam's Sons).

James: The Building of Cities, (The Macmillan Co.).

Chamberlain: The Continents and Their People; North America; South America; Europe, (The Macmillan Co.).

Allen: Geographical and Industrial Studies of Europe; South America, (new edition), (Ginn and Co.).

Twombly and Dana: The Romance of Labor, (The Macmillan Co.).

Coe: Modern Europe, (Silver, Burdett and Co.).

Coe: Our American Neighbors, (Silver, Burdett and Co.).

George: Little Journeys to Alaska and Canada, (Flanagan and Co.).

George: Little Journeys to England and Wales, (Flanagan and Co.).

George: Little Journeys to Hawaii and the Philippine Islands, (Flanagan and Co.).

Hayden: Canada: Britain's Largest Colony, (Cassell Publishing Co., London).

Bowman: South America, a Geographical Reader, (Rand, McNally and Co.).

Carpenter: North America; South America; Europe: (American Book Co.).

Carpenter: How the World is Fed, (American Book Co.).

Carpenter: How the World is Clothed, (American Book Co.).

Carpenter: How the World is Housed, (American Book Co.).

Stefansson: My Life with the Eskimo, (The Macmillan Co.)

Haskins: The Panama Canal, (Doubleday, Page and Co.).

Bishop: Panama, Past and Present, (The Century Co.).

Nature's Transformation at Panamafi (National Geographic Magazine, 28:159-194).

Nida: Panama and Its Bridge of Water, (Rand, McNally and Co.).

Hall: Panama and the Canal, (Newsom).

Hall: Dutch Days, (Newsom).

Jenks: Ba-long-long, the Igorot Boy, (Row, Peterson and Co.).

Krout: Alice's Visit to the Hawaiian Islands, (American Book Co.).

Seabury: Porto Rico, (Silver, Burdett and Co.).

Grierson: Scotland, (The Macmillan Co.).

Campbell: The Dutch Boy, (Educational Publishing Co.).

De Groat: When I Was a Girl in Holland, (Lothrop, Lee and Shepard).

Mansfield: Our Little Dutch Cousin, (L. C. Page and Co.).

Mansfield: Our Little English Cousin, (L. C. Page and Co.).

Hill: Cuba and Porto Rico, (The Century Co.).

An American Gibraltar: Notes on the Danish West Indies.

Mexico, (National Georaphic Magazine, 30:1-88).

Mexico, (National Geographic Magazine, 30:1-88).

Hasbrouck: Mexico from Cortez to Carranza, (D. Appleton and Co.).

Butler: Our Little Mexican Cousin, (L. C. Page and Co.).

Bradley: Canada, (Henry Holt and Co.).

Thomas: Trails and Tramps in Alaska and Newfoundland, (G. P. Putnam's Sons).

Lyde: A Geography of Africa, (The Macmillan Co.).

Lyde: A Geography of the British Isles, (The Macmillan Co.).

Finnemore: Italy, (The Macmillan Co.).

Champney: Three Vassar Girls in Switzerland.

Gueber: Legends of Switzerland, (Dodd, Mead and Co.).

Bingham: Across South America, (Houghton Mifflin and Co.).

Markwick and Smith: South American Republics, (Silver, Burdett and Co.).

Clarke: The Continent of Opportunity—South America, (Revell).

Du Chaillu: Wild Life Under the Equator, (Harper Brothers).

Pratt: Modern Europe, (Ginn and Co.).

McMurry: The Geography of the Great War, (The Macmillan Co.).

Torrance: Geographical Results of the Great War, (American Book Co.).

Badlam: Views of Europe, (Silver, Burdett and Co.).

Badlam: Views in Africa, (Silver, Burdett and Co.).

Lane: Strange Lands Near Home, (Ginn and Co.).

Lane: Under Sunny Skies, (Ginn and Co.).

Lane: Towards the Rising Sun, (Ginn and Co.).

Lane: Northern Europe, (Ginn and Co.).

Gaines: Lucita, A Child's Story of Old Mexico, (Rand, McNally and Co.).

Winslow: Our American Neighbors; Europe; Distant Countries, (D. C. Heath and Co.).

Smith: Eskimo Stories; Holland Stories, (Rand, McNally and Co.).

Geike: Geography of the British Isles, (The Macmillan Co.).

Niver and Farrel: North America and Its Dependencies, (Hinds, Hayden and Eldridge).

Twombly: Hawaii and Its People, (Silver, Burdett and Co.).

Willard: Along Mediterranean Shores, (Silver Burdett and Co.).

Peary: Children of the Arctic; Snow Baby and Snowland Folk, (Fred Stokes Co.).

Allen: Stories of the Rhine Country, (Educational Publishing Co.).

Carroll: Around the World Series, Book V, The British Empire, (Silver, Burdett and Co.).

Froelicher: Swiss Stories and Legends, (The Macmillan Co.).

McFee: Boys and Girls of Many Lands, (Crowell).

Ouida: A Dog of Flanders, (L. C. Page Co.).

Bealby: Peeps at Many Lands Series, (The Macmillan Co.).

Penfield: Holland Sketches, (Charles Scribner's Sons).

Grosvenor: The Races of Europe, (National Geographic Magazine, 34:441-534).

Our Foreign Born Citizen, (National Geographic Magazine, 31:95-130).

Smith: Commerce and Industry, (Henry Holt and Co.). Greater America: Latest Acquired Insular Possessions, (Ginn and Co.).

Greeley: Handbook of Alaska, (Charles Scribner's Sons).

Gibbs: Transportation Methods in Alaska, (National Geographic Magazine, 17:69-82).

Breaking Up of the Yukon, (National Geographic Magazine, 17:268-272).

Reindeer, (Literary Digest, 48:373-4, and 48:898-9).

Plummer: Roy and Ray in Canada, (Henry Holt and Co.).

Wright: Handbook of the Philippines, (A. C. McClurg).

Knapp: The Story of the Philippines, (Silver, Burdett and Co.).

Barrows: The History of the Philippines, (World Book Co.).

Stuart: The Adventures of Piang, the Moro Jungle Boy. (The Century Co.).

Mulets: Sunshine Lands of Europe, (World Book Co.).

Tappan: Travelers and Traveling, (Houghton Mifflin Co.).

Tappan: Makers of Many Things, (Houghton Mifflin Co.).

Mott: Fishing and Hunting, (American Book Co.).

Todd: Geography of France, (Rand, McNally and Co.).

ELEMENTARY SCIENCE.

Grade VII A.

Time allotment One hundred eighty minutes per week for Science and Geography.

Guide Topic: Water and How We Use It.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's "The Science of Everyday Life", pages 68 to 140, in the hands of the teacher, supplemented by Murché's "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction and the Suggestions to Teachers in the Van Buskirk and Smith.

Outline of Work.

Project V. Water in our Houses.

1. Water a necessity of life and of the human body.
2. Problems, pages 70 to 78.
3. Topics, pages 78 to 93.
    - a. Sources of drinking water.
    - b. Typhoid fever ofter spread by impure drinkwater.
    - c. Water pressure and water supply systems.
    - d. House piping system.
    - e. A hot-water heater.
    - f. Waste pipes of the house, and sewage disposal.
    - g. Changed forms of water: ice, vapor, steam.
    - h. Cooking food by boiling; changes produced.
    - i. Water as a solvent.
    - j. Hard and soft water.
4. Individual projects, pages 93 and 94.

Project VI. Water in the Air.

1. The weather.
2. Problems, pages 97 to 104.
3. Topics, pages 105 to 117.
    - a. How water vapor gets into the air.
    - b. The thermometer.
    - c. Temperature and the humidity of the air.
    - d. Condensation: clouds and dew.
    - e. Thunderstorms.
    - f. The winds of the world.
    - g. Storms and the Weather Bureau.
    - h. The value of rain.
4. Individual projects, page 117.

Project VII. Water and the Soil.

1. The value of water in the soil.
2. Problems, pages 121 to 124.
3. Topics, pages 125 to 138.
    - a. What soil contains.
    - b. Rocks: igneous, sedimentary, and metamorphic.
    - c. Action of water, ice, wind, air, plants, and animals in making soil.
    - d. Water in the soil: how it rises and how it is saved in the soil.

    e. Variation in amount of rainfall.
    f. Reclaiming desert regions; reclaiming swampy regions.
    g. Air in the soil.
    h. Acid soil and how to correct it.
4. Individual projects, pages 138 and 139.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

GEOGRAPHY.

Grade VII B.

Time allotment: One hundred eighty minutes per week for Geography and Science.

Guide Topics: South America; Europe.

Introduction.

(Study carefully the Introduction to the Seven A Grade Geography Course).

The principles of "General Geography" affecting climate should be applied in the study of these continents. Constant comparisons and contrasts should be made between them and North America and the United States. The teacher must look to see that definite conclusions are drawn in the discussions of problems and projects. The use of maps and of the globe is essential. Supplemental books should be consulted frequently.

To the people of the United States, the geography of Europe and South America is next in importance to that of their own country. Fairbanks' "Topical Outline of the Geography of Europe", has been found of great value in the preparation of the "Outline of Work".

Textbook: California State Series Advanced Geography, pages 284 to 436.

Outline of Work.

South America.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 281, and a basal study of:

1. Location, including latitude.
2. Size.
3. Surface and drainage, in comparison and contrast with North America.
    - a. Mountains.
    - b. Plains.
    - c. Coastlines.
    - d. Rivers.
4. Climate.
    - a. Temperature.
    - b. Rainfall.
        - (1). Winds.
        - (2). In tropical zone east of the mountains.
        - (3). In tropical zone west of the mountains.
        - (4). In the south temperate zones.
5. Plant and animal life.
    - a. In the jungle.
    - b. On the plains and in the mountains.
6. Inhabitants.

General Problem: To determine the natural resources of South America and its possibilities through development of them.

Brazil.

Preceding the consideration of the general problem and specific projects below, make a basal study of:

1. Extent, in comparison with the United States.
2. Climate.
3. Surface and drainage.
4. Resources and products.
    - a. Mineral.
    - b. Agricultural.
    - c. Forest.
    - d. Grazing.

General Problem: To determine why Brazil must become the most important country of South America.

Specific Projects.

To determine the extent and value of the tropical forests of Brazil.

For solution consider:

1. Appearance.

2. Products.
    a. Fruits.
    b. Nuts.
    c. Dye-woods.
    d. Vanilla.
    e. Mandioca and yerba-mate.
    f. Rubber.

Illustrative Type Lesson: Rubber.

1. Trees.
2. Conditions for cultivation.
3. Obtaining of crude rubber.
4. Preparation for market.
5. Demand for the product.
6. Uses.
7. Manufacturing centres.

To determine the importance of agriculture in Brazil.

For solution consider:

1. Coffee.
2. Cotton.
3. Sugar.
4. Tobacco.
5. Fruits and corn.

(For illustrative type lesson on "coffee", refer to the VII A Grade Geography Course).

To determine the extent and importance of the mineral resources and manufacturing industries of Brazil.

Argentina.

Preceding the consideration of the general problem and specific projects below, make a basal study of:

1. Extent.
2. Climate.
3. Surface and drainage.
4. Resources and products.

General Problem: To determine why Argentina is the most progressive country in South America.

Specific Projects.

To determine the extent and value of farming and ranching in Argentina.

To determine the importance of manufacturing and commerce in Argentina.

To determine why Argentina receives the largest immigration of all the countries of South America.

Uruguay and Paraguay.

General Problem: To determine the reasons for the slow development of these two countries.

For solution consider:

1. Position.
2. Climate.
3. Surface.
4. Products.
5. Government.

The Guianas and Venezuela.

General Problem: To determine the reasons for the slow development of these countries.

For solution consider:

1. Position.
2. Climate.
3. Surface and drainage.
4. Products.
5. Government.

Panama, Colombia, Ecuador, Peru, and Bolivia.

General Problem: To find the resemblances among these countries in respect to:

1. Extent.
2. Climate.
3. Surface and drainage.
4. Products.
5. Peoples.
6. Government.

Chile.

Preceding the consideration of the general problem and specific projects below, make a basal study of:

1. Extent.
2. Climate.
3. Surface and drainage.
4. Resources and products.

General Problem: To determine why Chile is the most progressive country on the western coast of South America.

Specific Projects.

To determine the mineral resources of Chile.

For solution consider:

1. Copper.
2. Lead.
3. Silver.
4. Coal.
5. Nitrates.

To determine the development of Chile in agriculture and cattle-raising.

For solution consider:

1. Grains.
2. Tobacco.
3. Vegetables.
4. Cattle.

To determine the value of guano as an export of Chile.

To determine the importance of manufacturing in Chile.

For solution consider:

1. Flour-milling.
2. Cheese-making.
3. Nitrate-refining.
4. Tanning.
5. Shoe-manufacturing.

To determine the location, ownership, and basis of importance of the following islands near the continent of South America: Galapagos Islands, The Falkland Islands, Trinidad, and Juan Fernandez.

To locate on an outline-map of South America the following items: chief mountains, rivers, lakes, cities, and national boundaries. (This map may be a five-minute sketch map made by the pupil, or be a mimeographed copy furnished to him).

To determine in what country one would prefer to settle if emigrating to South America.

To determine what products of South America are extensively used by the people of the United States.

To determine the benefits to be derived by developing a closer relationship between the United States and South American countries.

To determine the location of the following principal cities of South America, the countries to which they belong, and the reasons for their importance: Rio de Janeiro, Para, Santos, Buenos Ayres, Montevideo, Callao, La Paz, Lima, Quito, and Bogota.

To take imaginary trips to places or objects of special interest, such as:

A rubber plantation.
A coffee plantation.
A coast city of Brazil.
A cattle ranch in the pampas region of Argentina.
A nitrate refining plant in Chile.

Europe.

(Review the Six A Grade Geography Course relating to Europe).

General Problem: To determine the reasons for the great importance of Europe in the history of the world.

The British Isles.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 313, and a basal study of

1. Location, including latitude.
2. Size.
3. Surface and drainage.
4. Climate.
5. Natural resources.
6. Character of inhabitants.
7. Extent, number, distribution and importance of colonies.

General Problem: To determine the reasons for the great importance fo the British Isles. (Refer to Fairbanks, pages 33 to 39).

Specific Projects.

To determine the reasons for the extent of agriculture in the British Isles.

For solution consider:

1. Stock-raising.
2. Oats, barley, wheat, and vegetables.
3. Products not raised.

To determine the great importance of the fishing industry of the British Isles.

For solution consider:

1. Cod.
2. Herring.
3. Haddock.
4. Sole.
5. Salmon.
6. Oysters.

To compare the fishing industry of the British Isles with that of the northeastern coast of North America.

To determine the great importance of the mining industry of the British Isles.

For solution consider:

1. Tin.
2. Coal.
3. Iron.
4. Building stones.
5. Salt.

To determine the reasons why the British Isles are extensively engaged in manufacturing.

For solution consider:

1. Natural resources,
    - a. Water-power.
    - b. Coal.
    - c. Iron-ore.
    - d. Wool.
    - e. Flax.

Illustrative Type Lesson: Flax.

(Adapted from the Topeka Course of Study in Geography, 1918).

1. Description of plant.
    - a. Stalk.
    - b. Leaves.
    - c. Flowers.
2. Sources of supply.
    - a. Russia, Ireland, Belgium, etc.
3. Cultivation.
    - a. Climate.
    - b. Soil.
    - c. Methods of plowing, planting, weeding, pulling, and separating of long stalks from short ones.
    - d. Rippling.
    - e. Retting.

    f. Scutching.
    g. Heckling.
    h. Rolling and winding.
    i. Uses.
4. Labor supply.
5. Inventions.
6. Kinds of manufactures.
    a. Cotton goods.
    b. Linen goods.
    c. Woolen goods.
    d. Iron and steel products.
7. Leading exports.

To determine the relationship between British commerce and the importation of raw material and manufactured articles.

For solution consider:

1. Coffee from South America and Central America, and tea from India.
2. Grain from Manitoba, the United States, and India.
3. Animal products from Argentina, Canada, Russia, and the United States.
4. Cotton from the United States, India and Egypt.
5. Oil from Mexico.
6. Machinery from the United States.
7. Flax from Russia.

To determine to what extent the natural resources and industries of Ireland have been developed.

To determine the relationship of Great Britain to her colonies in respect to commerce.

To locate on an outline-map of the British Isles the following items: Chief mountains, rivers, lakes, countries, cities, and larger adjacent waters.

(This may be a five-minute sketch map made by the pupil, or a mimeographed map, copy furnished to him.)

To determine why Great Britain must be a great naval power.

To determine the reasons for the great size and importance of London.

For solution consider:

1. Advantages of location.
2. Early history.
3. Manufactures and commerce.

4. Importance in other respects.
5. Points of interest near London.

To determine the location of the following principal cities of the British Isles, and the reasons for their importance: Glasgow, Dublin, Liverpool, Birmingham, Manchester, and Edinburgh.

To take imaginary trips to places or objects of special interest, such as

Parliament House.
Westminister Abbey.
The British Museum.
Lakes of Killarney.
A cotton factory.
A linen factory.
Stratford-on-Avon.
A ship-yard on the Clyde.
Greenwich Observatory.
Oxford and Cambridge Universities.

(For further specific problems, see Fairbanks' "Topical Outline of the Geography of Europe," pages 36 and 37).

The Netherlands and Belgium.

(For the preliminary basal study of these countries follow in general the outline above for the British Isles).

(For the study of these countries select appropriate problems and projects from Fairbanks' "Topical Outline of the Geography of Europe," pages 74 to 78).

Switzerland.

(Using the material of the State textbook, pages 405 to 410, and of supplementary books, develop the problems as indicated in the Fairbanks, pages 79 to 82).

France.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 337, and a basal study of

1. Location, including latitude.
2. Size.
3. Surface and drainage.
4. Climate.
5. Natural resources.
6. Character of inhabitants.

General Problem: To determine the reasons for the great importance of France.

(Refer to Fairbanks, pages 68 to 73).

Specific Projects.

(Compare and contrast at all points with the British Isles and with the corresponding Section of the United States).

To determine the reasons for the extent of agriculture in France.

For solution consider:

1. Wheat.
2. Grapes.
3. Live-stock.

To determine the value of the mineral resources of France.

For solution consider:

1. Coal.
2. Iron.
3. Building stone.
4. Fire clays.

To determine the reasons why France is extensively engaged in manufacturing and commerce.

For solution consider:

1. Cotton goods.
2. Woolen goods.
3. Silk.
4. Wine.
5. Metal.
6. Leading exports.

To determine the reasons for the great size and importance of Paris.

For solution consider:

1. Location and early history.
2. Manufactures.
3. Commerce.
4. Art.

To determine the location of the following principal cities of France, and the reasons for their importance: Havre, Calais, Marseilles, Bordeaux and Lyon.

To take imaginary trips to places or objects of special interest as

The Louvre.
Versailles.
The Tuileries.

(For further projects, consult the Fairbanks, pages 72 and 73).

Spain and Portugal.

(For the preliminary basal study of these countries follow in general the outline above for France, drawing comparisons and contrasts at all points. See the State textbook, Figure 337. Select appropriate problems and projects from the Fairbanks, page 45. For other material, consult McMurry's "Geography of the Great War," and Torrance's "Geographical Results of the Great War.")

Norway, Sweden, and Denmark.

(For the preliminary basal study of these countries follow in general the outline above for France, making comparisons and contrasts at all points. See the textbook, Figure 353. Select appropriate problems and projects from the Fairbanks, pages 72, 73, and 77).

Italy, Greece, the Balkan Countries, and Turkey in Europe.

(Using the material of the State textbook and supplementary books, develop appropriate problems as indicated in the Fairbanks, pages 47 to 62. Also, consult McMurry's "Georgraphy of the Great War," and Torrance's "Geographical Results of the Great War").

Russia, Germany, Austria, Hungary, and Other European Countries Not Heretofore Specified.

(Using the material of the State textbook and supplementary books, develop appropriate pdoblems as indicated in the Fairbanks, pages 83 to 112. Also, consult McMurry, and Torrance).

Reference List.

See the Reference List given for the Seven A Grade Geography Course.

ELEMENTARY SCIENCE.

Grade VII B.

Time allotment: One hundred eighty minutes per week for Science and Geography.

Guide Topics: Foods and How We Use Them.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's "The Science of Everyday Life", pages 141 to 224, in the hands of the teacher, supplemented by Murche's "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction and the Suggestions to Teachers in the Van Buskirk and Smith.

Outline of Work.

Project VIII. Plants,—Food Makers for the World.

1. Foods,—a necessity of life, and need of conservation.
2. Problems, pages 142 to 152.
3. Topics, pages 152 to 161.
   a. Where our foods come from.
   b. Organic and inorganic foods.
   c. The nutrients.
   d. Physical and chemical changes.
   e. Where and how plants get their food.
   f. How water passes through a plant.
   g. Where foods are manufactured.
   h. The raw materials needed.
   i. Starch works only in green plants through the energy of the sun.
   j. The waste product, oxygen.
   k. All the organic nutrients made by leaves.
   l. Helping plants make foods.
   m. Nitrogen fixing bacteria.
   n. Electricity as a means of taking nitrogen out of the air.
   o. Home gardens.
4. Individual projects, pages 161 and 162.

Project IX. Foods and the Human Body.

1. The two great uses of food.
2. Problems, pages 164 to 167.
3. Topics, pages 167 to 187.
   a. How to select foods relative to nourishment, cost, quality, and digestibility.
   b. Tea, coffee, and other food adjuncts.
   c. Why we cook foods; value of some uncooked foods.
   d. Digestion and its uses,—in mouth, stomach, and intestines.

    - e. Circulation of the blood.
    - f. Treatment of cuts, stomach, headaches.
    - g. The teeth and their care.
    - h. Effects of alcohol and tobacco upon digestion and circulation.
- 4. Individual projects, page 187.

Project X. Foods in the Home.

- 1. Clean foods.
- 2. Problems, pages 189 to 196.
- 3. Topics, pages 196 to 206.
    - a. Why foods spoil.
    - b. Action of bacteria, mold, and yeast on foods.
    - c. How to protect foods from mold, harmful bacteria, and yeasts.
    - d. The cold pack method of canning.
    - e. Drying foods.
    - f. Milk.
    - g. Meat.
    - h. Cleanliness in the kitchen.
    - i. The work of a city health department.
    - j. Pure food and drug laws.
- 4. Individual projects, page 206.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

GEOGRAPHY.

Grade VIII A.

Time allotment: One hundred eighty minutes per week for Geography and Science.

Guide Topics: Asia; Africa; Australia; New Zealand; the East India Islands.

Introduction.

In the main, the Introduction to the Seven A and to the Seven B Grades Geography Course is applicable to the work of this Grade, and should be studied and followed accordingly.

Textbook: California State Series Advanced Geography, pages 436 to 514, and supplementary books.

Asia.

Outline of Work.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 403, and a basal study of:

1. Location, including latitude.
2. Size.
3. Surface and drainage.
    - a. Four great divisions as determined by the mountain highlands.
    - b. Rivers.
    - c. Coastline.
4. Climate.
    - a. Influence of prevailing winds.
    - b. Influence of mountain ranges.
5. Plants and animals.
    - a. Resemblances between those of Northern Asia and Europe.
    - b. Resemblances between those of Southern Asia and Africa.
    - c. Domesticated animals.
6. Inhabitants.
    - a. Number and location.
    - b. Races.
    - c. Religions.

General Problem: To determine the natural resources of Asia and its present day problems.

Syria and Adjacent Countries,
(formerly Turkey in Asia).

General Problem: To determine the natural resources, early civilization, and present day problems of the countries of Southwestern Asia.

Specific Projects.

To determine the territorial changes in this region that have resulted from the great world-war.

(Consult Fairbanks' "The New Geography, Book IV, Part III", Torrance's "Geographical Results of the Great War", and McMurry's "Geography of the Great War").

To determine the reasons for the interest in and the importance of Syria.

For solution consider:

1. Government.
2. Damascus.
3. Palestine, The Holy Land.
    - a. Area.
    - b. Surface.
    - c. Climate.
    - d. Important historical events.
    - e. Products.
    - f. Commerce.
    - g. Present attractions.
    - h. Cities.
        - (1). Jerusalem.
        - (2). Joppa.

Arabia, Persia, and Afghanistan.

General Problem.

To determine the geographical interest in Arabia.

For solution consider:

1. Surface.
2. Climate.
3. Earlier importance.
4. Government.
5. Population.
6. Products.
7. Commerce.
8. Mecca.

(In a similar manner, treat Persia, and Afghanistan).

Russia in Asia.

General Problem.

To determine the natural resources and possibilities through development of Russia in Asia.

For solution consider:

1. Area and divisions.
2. Climate.
3. Plant and animal life.
4. Importance in the past.
5. Natural resources and products.
6. Prospects for the future.
7. Leading cities.
    - a. Vladivostok.
    - b. Irkutsk.

India and Ceylon.

General Problem: To determine the value of India and Ceylon to the British Empire.

For solution consider:

1. Density of population.
   a. Danger of famines and plagues.
2. Government.
3. Natural resources.
   a. Timber.
   b. Minerals.
4. Products.
   a. Wheat.
   b. Cotton.
   c. Sugar cane.
   d. Indigo.
   e. Jute.
   f. Rice.
   g. Spices.
   h. Tea.
   i. Bamboo.
5. Occupations of people.
6. Development of irrigation.
7. Development of railroads.
8. Cities.
   a. Calcutta.
   b. Bombay.
   c. Madras.
   d. Lucknow.
   e. Benares.
   f. Delhi.

Illustrative Type Lesson: Tea.

1. Regions of production.
2. Description of plant.
3. Conditions of production.
4. Methods of cultivation.
5. Preparation for market.
6. Uses.
7. Markets.

(For further development of the topic "tea," refer to Allen's "Asia". page 75).

(The above model may be followed in the study of "bamboo." For "silk," see the illustrative type lesson under "China," below.)

Indo-China and the Malay Peninsula.

General Problem.

To determine the importance of these divisions of the Indian Empire.

(Develop a type lesson on "teak").

China.

To determine the natural resources and possibilities through development of China.

For solution consider:

1. Area.
2. Climate.
3. Plant and animal life.
4. Population.
   - a. Distribution and density.
   - b. Character.
   - c. Customs.
5. Character of civilization.
   - a. Advanced early culture.
   - b. Slow later development.
     1. Religion.
     2. Education.
     3. Transportation facilities.
        - a. Waterways and canals.
        - b. Lack of railroads.
     4. Injustice of foreigners.
     5. Opposition to modern improvements and to foreigners.
   - c. Recent changes.
     1. Governmental.
     2. Industrial.
     3. Educational.
6. Resources and products.
   - a. Farm products.
   - b. Mineral resources.
   - c. Silk industry.
   - d. Paper making.
   - e. Ivory carving.
   - f. Fishing.
7. Prospects for the future
8. Chief cities.
   - a. Canton.
   - b. Hongkong.
   - c. Shanghai.

    - d. Peking.
    - e. Foo-Chow.
    - f. Tientsin.

Illustrative Type Lesson: Silk.

1. Regions of production.
2. The silk-worm.
    - a. The egg.
    - b. The caterpillar.
    - c. The cocoon.
3. Preparation for market.
    - a. Food of the silk-worm.
    - b. Unwinding of the cocoon.
    - c. Spinning and weaving.
4. Uses.
5. Markets.

(For development of the topic "rice," refer to this Course, Six B Grade).

(For development of the topic "tea," refer to the illustrative type lesson under "India", this Grade).

Japan.

General Problem.

To determine the reasons for the great importance of Japan.

For solution consider:

1. Importance of location.
2. Area, in comparison with the British Isles.
3. Surface and climate, in comparison with the New England States.
4. Population.
    - a. Density.
    - b. Character.
    - c. Customs and religion.
5. Character of civilization.
    - a. Origin and early development.
    - b. Recent awakening and rapid progress.
        - 1. Governmental.
        - 1. Industrial.
        - 3. Commercial.
        - 4. Educational.
6. Resources and products.
    - a. Lumbering.
    - b. Agriculture.

    - c. Fishing.
    - d. Manufacturing.
    - e. Mining.
7. Chief cities.
    - a. Tokio.
    - b. Yokohama.
    - c. Kobe.
    - d. Kioto.
    - e. Nagasaki.
    - f. Osaka.

(For illustrative type lessons, refer to earlier models in this Course).

Further Projects in study of Asia.

To trace a ship from Hongkong to London and return, noting the composition of the cargo in both directions.

To compare modes of living in various Asiatic countries,—tents in the desert, bamboo houses in Japan, and boat-houses in China.

To compare the modes of travel in the various Asiatic countries,—the bullock-cart, wheelbarrow, jinrikisha, elephant, camel, railroad.

To make real or imaginary visits to places or objects of special interest, such as:

Confucius' tomb.
The banks of the Ganges.
The Mosque at Mecca.
The Taj-Mahal.
A teak-forest in Siam.
A tea plantation.
A rice field.
A silk factory.
The city of Peking.
The city of Tokio.

Africa.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 443, and a basal study of:

1. Location, including latitude.
2. Size.
3. Surface and drainage.

4. Climate.
    a. General character.
    b. Forest belt.
    c. Savannahs.
    d. The desert regions.
5. Plant and animal life.
6. Inhabitants.
7. Exploration and settlement.

General Problem: To determine the natural resources of Africa and its possibilities of development.

Specific Projects.

To determine the natural resources and possibilities of development of Northern Africa.

For solution consider:

1. Egypt and neighboring British territory.
    a. River Nile.
    b. Suez Canal, in comparison with the Panama Canal.
    c. Cairo, Alexandria, and Port Said.
2. Morocco, Algiers, and Tunis.
3. Sahara Desert.
    a. Extent.
    b. Surface.
    c. Caravans.
    d. Oases.

To determine the natural resources and possibilities of development of Southern Africa, in comparison with Northern Africa.

For solution consider:

1. Mineral wealth.
    a. Gold.
    b. Diamonds.
    c. Copper, iron, and coal.
2. Agriculture.
    a. Sugar cane.
    b. Bananas and pineapples.
    c. Tea; coffee.
    d. Rice.
    e. Wheat.
3. Lack of conveniences for communication and transportation.
4. Cape Town, Kimberley, Pretoria, and Johannesburg.

To determine the natural resources and possibilities of development of Central Africa, in comparison with other sections of Africa.

For solution consider:

1. Rivers.
   a. Zambesi.
   b. Niger.
   c. Congo.
2. Native inhabitants.
3. Territorial divisions.
   a. Soudan.
   b. Abyssinia.
   c. Congo Free State.
   d. Liberia.
4. Need of railroads.

To locate the islands off the coast of Africa and the extent of their importance.

1. Madagascar and Zanzibar.
2. Madeiro, Cape Verde, and Canary Islands.
3. St. Helena.
4. Ascension Islands.

Further Projects.

To determine why Africa, with her natural advantages, is so sparsely settled and so undeveloped.

To determine the advantage to Africa of European colonization.

To determine the present day needs of Africa.

Australia.

Preceding the consideration of the general problem and specific projects below, make a study of map-questions as shown in the textbook under Figure 467, and a basal study of:

1. Location, including latitude, in comparison with the United States.
2. Size, in comparison with the United States.
3. Surface and drainage.
   a. Mountains.
   b. Coastline.
4. Climate.
5. Plants and animals.
6. People.

General Problem: To determine the importance of Australia as a commonwealth of the British Empire.

For solution consider:

1. History of settlement.
2. Government.
3. Natural resources.
4. Products and industries.
5. Character of civilization.
6. Cities and harbors.
    - a. Melbourne.
    - b. Sydney.
    - c. Adelaide.
    - d. Brisbane.
    - e. Perth.

Specific Projects.

To explain the reasons why the plant and animal life of Australia is so different from that of other regions of the earth's surface.

To compare Australia and the Western States of the United States in respect to products and industries.

To determine whether Australia can compete today with the United States or England.

To determine the advantages to Australia of the public ownership of railroads.

To trace a ship from San Francisco to Sydney and return, noting the composition of the cargo in both directions.

New Zealand.

General Problem: To determine the reasons for New Zealand's importance as a dominion of the British Empire.

For solution consider:

- a. Location.
- b. Size, in comparison with Australia.
- c. Surface and drainage.
- d. Climate.
- e. Products and industries.
- f. Government.
- g. Commerce.
- h. People.
- i. Chief cities.
    1. Wellington.
    2. Auckland.
    3. Christchurch.

Java, Sumatra, and the other East Indies.

General Problem: To determine the reasons for the relative importance of Java, Sumatra, and the other East Indies.

For solution consider:

1. Chief products.
2. Exports.
3. Political relations.

Reference and Supplementary Reading List.

Travel Magazine, (McBride).

National Geographic Magazine.

Geographic News Bulletin, (Prepared weekly by the National Geographic Society).

Fairbanks: New Geography, Book IV, Part III, (Harr Wagner Publishing Co.).

Brigham and McFarlane: Essentials of Geography, Second Book, (American Book Co.).

Tarr and McMurry: New Geography, Second Book, (The Macmillan Co.).

Sutherland and Sanford: Practical Exercises in Geography. Our Own Country and Her Possessions, (Silver, Burdett and Co.).

Wiswell: Globes and Maps—A Teacher's Manual, (Rand, McNally and Co.).

Frye-Atwood: New Geography, Book Two, (Ginn and Co.).

Johnston: Mathematical Geography, (American Book Co.).

Dryer: Elementary Economic Geography, (American Book Co.).

McMurry: Larger Types of American Geography, (The Macmillan Co.).

McMurry: Type Studies from the Geography of the United States, (The Macmillan Co.).

Rabenort: Asia, Africa, Australia, (American Book Co.).

White: The Development of Africa, (Philip, London).

Rocheleau: Geography of Commerce and Industry, (Educational Publishing Co.).

James: The Building of Cities, (The Macmillan Co.).

Johnson: Ocean and Inland Water Transportation, (D. Appleton and Co.).

Smith: The Story of Iron and Steel, (D. Appleton and Co.).

Blaich: Three Industrial Nations, (American Book Co.).

Longman: New School Atlas, (Longman, Green and Co.).

Chase and Clow: Industrial Studies, Volume Two, (Educational Publishing Co.).

Rutter: Wheat Growing in Canada, the United States, and Argentine, (The Macmillan Co.).

Gilson: Wealth of the World's Waste Places and Oceania, (Charles Scribner's Sons).

Chamberlain: The Continents and Their People, (The Macmillan Co.).

Tower: Story of Oil, (D. Appleton and Co.).

Allen: Geographical and Industrial Studies of Europe; South America; Asia, (Ginn and Co.).

Mead: Story of Gold, (D. Appleton and Co.).

Carpenter: North America; South America; Europe; Asia; Australia and Islands of the Sea, (American Book Co.).

George: Little Journeys to Other Lands, (Flanagan and Co.).

Smith: Life in Asia, (Silver, Burdett and Co.).

Gibson: In the Golden East, (Little, Brown and Co.).

Lee: When I was a Boy in China, (Lothrop, Lee and Shepard).

Reynolds: How Man Conquered Nature, (The Macmillan Co.).

Werthner: How Man Makes Markets, (The Macmillan Co.).

Abbott: South Seas, (The Macmillan Co.).

Du Chaillu: Land of the Long Night, (Ginn and Co.).

Bishop: Panama, Past and Present, (The Century Co.).

Story of Panama, 1913, (Mentor Association, 52 East 19th St., New York).

Coe: Modern Europe; Our American Neighbors, (Silver, Burdett and Co.).

Coe: The World and Its People, (Silver, Burdett and Co.).

Bowman: South America, (Rand, McNally and Co.).

Carpenter: How the World is Fed, (American Book Co.).

Carpenter: How the World is Clothed, (American Book Co.).

Carpenter: How the World is Housed, (American Book Co.).

Johnston: China, (Murray).

Burks: Barbara's Philippine Journey, (World Book Co.).

Channing and Lansing: The Story of the Great Lakes, (The Macmillan Co.).

Chisholm: Commercial Geography, (Longmans, Green and Co.).

Curwood: The Great Lakes, (G. P. Putnam's Sons).

Dodge: Commercial Geography, (Rand, McNally and Co.).

Green: Coal and Coal Mines, (Houghton Mifflin and Co.).

Bishop and Keller: Industry and Trade, (Ginn and Co.).

Martin: Story of a Piece of Coal, (D. Appleton and Co.).

Nicholls: Story of American Coal, (Lippincott).

Smith: Commerce and Industry, (Henry Holt and Co.).

Toothaker: Commercial Raw Materials, (Ginn and Co.).

Willets: Workers of the Nation, (Dodd, Mead and Co.).

Van Bergen: Story of Russia, (American Book Co.).

Van Bergen: Stories of China, (American Book Co.).

Van Bergen: Stories of Japan, (American Book Co.).

Krout: Two Girls in China, (American Book Co.).

Lyde: Man and His Markets, (The Macmillan Co.).

Southworth and Kramer: Great Cities of the United States, (Iroquois Publishing Co.).

Williston: Hindu Tales, (Rand, McNally and Co.).

Fisher: Resources and Industries of the United States, (Ginn and Co.).

Hotchkiss: Representative Cities of the United States, (Houghton Mifflin Co.).

Roosevelt: Stories of the Great West, (The Century Co.).

Rocheleau: Great American Industries, (Flanagan and Co.).

1. Mineral.
2. Products of the Soil.
3. Manufacturing.
4. Transportation.

Rusmisel: Industrial and Commercial Geography of the United States, (A. N. Palmer Co.).

Cunningham and Lancelot: Soils and Plant Life as Related to Agriculture, (The Macmillan Co.).

McGowan and Waite: Textiles and Clothing, (Rand, McNally and Co.).

Sherman: Food Products, (The Macmillan Co.).

Woolman and McGowan: Textiles, a Handbook for the Student and the Consumer, (The Macmillan Co.).

Van Hise: Conservation of Natural Resources of the United States, (The Macmillan Co.).

Mather: Progress and Development of Our National Parks, (Department of Interior, 1916, Washington, D. C.).

Yard: The Top of the Continent, Our National Parks, (Charles Scribner's Sons).

Report of Irrigation Investigations, Bulletin 104, 1900. Bulletin 119, 1901, (United States Department of Agriculture, Washington, D. C.).

Lane: Triumphs of Science, Youth's Companion Series, (Ginn and Co.).

National Geographic Magazine:

1. Nature's Transformation at Panama, 28:159-194.
2. Experiences in Grand Canyon, 26:99-184.
3. Cape Cod Canal, 26:185-190.
4. Alaska's New Railway, 28:567-589.
5. An American Gibraltar, 30:89-96.

World's Work: The Assuan Dam, January 1913, page 332.

Kirkland: The Great Mississippi Dam; (World's Work, January 1913, page 337).

Shoemaker: The Great Siberian Railroad, (G. P. Putnam's Sons).

Twombly and Dana: The Romance of Labor, (The Macmillan Co.).

Chase and Clow: Stories of Industry, (Educational Publishing Co.).

Bengston and Griffith: The Wheat Industry, (The Macmillan Co.).

Huntington and Elsworth: Asia, A Geographical Reader, (Rand, McNally and Co.).

Bond: With Men Who Do Things, (Munn).

Bond: Pick, Shovel, and Pluck, (Munn).
Redway: All Around Asia, (Charles Scribner's Sons).
Seeley: Story of the Earth, (D. Appleton and Co.).
Herbertson: Man and His Work, (Adam and Charles Black, London).
Adams: Elementary Commercial Geography, (D. Appleton and Co.).
Brigham: Commercial Geography, (Ginn and Co.).
Torrance: The Geographical Results of the Great War, (American Book Co.).
Chamberlain: Oceania, (The Macmillan Co.).
Tappan: Travelers and Traveling, (Houghton Mifflin Co.).
Tappan: Makers of Many Things, (Houghton Mifflin Co.).
The Sixteenth Yearbook, (Public School Publishing Co.). Co.).
The Nineteenth Yearbook, Parts I and II, (Public School Publishing Co.).
Talbot: Railway Conquest of the World, (J. B. Lippincott Co.).
Braine: Merchant Ships and What They Bring Us, (E. P. Dutton and Co.).
Smith: The Organization of Ocean Commerce, (University of Pennsylvania).
Ward: Climate, (G. P. Putnam's Sons).
Myrick: Book of Corn, (Orange Judd Company, New York).
Baldwin and Livingood: Sailing the Seas, (The American Book Co.).
King: Farmers of Forty Centuries. Rice Culture, (Mrs. F. H. King, 1540 University Ave., Madison, Wisconsin).
Freeman and Chandler: The World's Commercial Products, (Ginn and Co.).

ELEMENTARY SCIENCE.

Grade VIII A.

Time allotment: One hundred eighty minutes per week for Science and Geography.

Guide Topics: The Forces of Nature. Protection—Homes and Clothing.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's "The Science of Everyday Life", pages 208 to 306, in the hands of the teacher, supplemented by Murché's "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction and the Suggestions to Teachers in the Van Buskirk and Smith.

Outline of Work.

1. Introduction.
   - a. Law of cause and effect.
   - b. Early explanation of natural phenomena.
   - c. Matter and energy.
   - d. Forms and sources of energy.
   - e. Energy can not be originated or destroyed.
   - f. Some common sources of energy.
   - g. Original source of all energy upon the earth.
   - h. The solar system.
   - i. Year, seasons, day and night, time, gravitation.
2. Individual projects, page 223.

Project XI. Building our Homes.

1. Homes in different parts of the world.
2. Problems, pages 226 to 234.
3. Topics, pages 234 to 245.
   - a. Choosing a house.
   - b. How a house is built.
   - c. Materials used in building our houses.
   - d. Hard woods and soft woods, and difference in value.
   - e. Relative durability of common woods.
   - f. Houses of brick, concrete, and stucco.
   - g. Building stones.
4. Individual projects, pages 245 and 246.

Project XII. Lighting our Homes.

1. A well-lighted house,—some questions to answer.
2. Problems, pages 248 to 256.
3. Topics, pages 256 to 269.
   - a. How our houses are lighted by the sun.
   - b. Reflected, diffused, and refracted light.
   - c. Why anything has color; colors in sunlight.

    - d. A lens.
    - e. A camera.
    - f. The human eye.
    - g. Natural and artificial lighting.
    - h. Conductors and insulators.
    - i. Switches and fuses.
    - j. Edison and the electric light.
4. Individual projects, page 269.

Project XIII. Heating our Homes.

1. The necessity for heat.
2. Problems, pages 271 to 275.
3. Topics, pages 275 to 284.
    - a. Wood as a fuel.
    - b. The story of coal.
    - c. The best temperature for houses.
    - d. The fireplace as a heater.
    - e. Three ways of distributing heat: radiation, conduction, and convection.
    - f. A stove as a heater.
    - g. Hot air, hot water, and steam heating.
    - h. Gas heaters.
4. Individual projects, pages 284 and 285.

Project XIV. Clothing and its Care.

1. Where our clothes come from; science of clothing.
2. Problems, pages 287 to 293.
3. Topics, pages 293 to 305.
    - a. The purpose of clothing.
    - b. Cooling effects of evaporation.
    - c. Relation between color of clothing and its warmth.
    - d. Waterproof clothes.
    - e. Makers of fibers: cotton, flax, and others.
    - f. Wool, silk, and artificial silk.
    - g. Other animal resources for clothing.
    - h. Care of clothing.
    - i. Clothes moths.
4. Individual projects, pages 305 and 306.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

GEOGRAPHY.

Grade VIII B.

Time allotment: One hundred eighty minutes per week for Geography and Science.

Guide Topic: Commerce and Industry of the World—
A Comparative Study.

Introduction.

The work of this Grade is planned not only with the thought of unifying the knowledge obtained by the pupil through the intensive studies of the preceding grades, but also of introducing him to a larger conception of the world's activities. A broad general problem and specific problems and projects calling for extended comparisons and contrasts are introduced. Such a treatment involves various methods of bringing out these comparisons and contrasts. Certain of these methods that may be noted are: (a), preparation of charts and graphs to illustrate comparative production of raw materials; (b), construction of product maps; (c), illustrations of relative values of manufactured goods; (d), use of tables of contents and topical indices. A geographical museum should prove of great interest. The work should be specific rather than too general.

The necessary information may be obtained from the current standard magazines and periodicals, for which Poole's Index and the Reader's Guide should be consulted in the City Library. An excellent list of materials, available at little or no expense, may be found in the Journal of Geography for May, 1917, Volume XV, number 9. The Journal of Geography for January, 1917, contains an article of value entitled "Travel Booklets".

The teacher may gain much useful information for her own guidance from Semple's "American History and Its Geographic Conditions", and Brigham's "Geographical Influences in American History". Helpful suggestions in connection with comparative work are found in Kaho's "Note Book for Construction Work in Commercial Geography".

Textbook: State Series Advanced Geography, pages 515 to 526.

For supplemental material consult Rocheleau's "Geography of Commerce and Industry", Smith's "Commerce and Industry", and Bishop and Keller's "Industry and Trade".

General Problem: To determine the dependence of the nations of the world upon one another, with emphasis upon current events.

Specific Problems or Projects.

To determine five chief raw products of the United States, and the countries to which the surplus is exported.

For solution, select from:

1. Wheat.
2. Corn.
3. Cotton.
4. Sugar cane and sugar beets.
5. Livestock.
6. Coal.
7. Iron.
8. Copper.
9. Gold.
10. Silver.
11. Petroleum.

To determine five chief raw products imported into the United States, and the countries from which they come.

For solution, select from:

1. Coffee.
2. Tea.
3. Cocoa.
4. Rubber.
5. Silk.
6. Sugar.
7. Rice.
8. Hides.
9. Wool.
10. Tobacco.
11. Diamonds.

To determine five leading manufactured products of the United States, and the countries to which the surplus is exported.

To determine five leading manufactured products imported into the United States, and the countries from which they come.

To determine to what extent the United States may depend upon her own resources.

To determine the effect of means of transportation by rail and water upon the development of the United States.

For solution consider:

1. Unifying influence of railroads as to language and customs as compared with conditions in other countries.
2. Economic influences of rail and water transportation.

(Special references: Bulletins "Railway Regulation and Control", issued by Railway Executive Advisory Committee, 63 Home Life Building, Washington, D. C., and the list of United States public documents relating to railroads, merchant marine, etc., issued by Superintendent of Public Documents, Washington, D. C.).

To determine the effect of government ownership of railroads.

To determine the recognized need that led to the construction and the resulting value of great engineering feats.

For solution consider:

1. Tunnels.
   a. Simplon.
   b. St. Gothard.
   c. Mt. Cenis.
   d. Tube under the Hudson.
2. Bridges.
   a. Eads.
   b. Brooklyn.
   c. Quebec.
   d. Firth of Forth.
   e. London.
3. Highways.
   a. Lincoln.
   b. El Camino Real.
4. Aqueducts.
   a. New York City.
   b. Los Angeles.
   c. Perth.
   d. Hetch-Hetchy.
5. Dams for the utilization of water for power and irrigation.
   a. Keokuk.
   b. Niagara Falls.

    - c. Roosevelt.
    - d. Along "Fall Line".
    - e. Punjab.
    - f. Assuan.
6. Reclamation projects.
    - a The dykes of Holland.
    - b. Draining of swamps.
    - c. Irrigation of arid lands.
7. Canals.
    - a. Grand Canal of China.
    - b. Suez.
    - c. Panama.
    - d. Sault Ste. Marie. (The "Soo").
    - e. Kiel.
    - f. Manchester.

To fix the great undeveloped regions of the earth, suggesting what the possibilities of these regions may be when developed.

To determine the reasons why the United States may hope for great progress in the future.

For solution consider:

1. Youthfulness.
2. Abundance of room.
3. Variety of climatic and surface features.
4. Bountiful natural resources.
5. Character of the people.
6. Attention to education.
7. Nature of the government.

To determine why California is the most favored spot on earth in which to establish a home.

For solution consider:

1. Mildness and variety of climate.
2. Variety of landscape.
3. Productivity of soil.
4. Progressiveness of people.
5. Educational facilities.

Reference and Supplementary Reading List.

(See the list given for the Eight A Geography Course).

ELEMENTARY SCIENCE.

Grade VIII B.

Time allotment: One hundred eighty minutes per week for Science and Geography.

Guide Topic: The Work of the World.

Introduction.

The scope of the Course is indicated by Van Buskirk and Smith's, "The Science of Everyday Life", pages 307 to 391, in the hands of the teacher, supplemented by Murché's, "Science Readers", and other available material. All teachers of this subject will find it most helpful to read the Introduction and the Suggestions to Teachers in the Van Buskirk and Smith.

Outline of Work.

Project XV. Work with Everyday Machines.

1. Machines in our home.
2. Problems, pages 308 to 317.
3. Topics, pages 317 to 331.
    a. Necessary work.
    b. Work requires energy and force.
    c. Work results in motion.
    d. Resistance to work: weight, friction, inertia.
    e. How work is measured.
    f. Simple machines: the lever, crank and axle, pulley, inclined plane, and wedge.
    g. Galileo.
    h. The invention of the pendulum clock.
    i. Complex machines.
4. Individual projects, page 331.

Project XVI. Communication: (Connect closely with the Geography Course, and the Civics Course).

1. Importance of communication to our civilization.
2. Problems, pages 333 to 337.
3. Topics, pages 337 to 348.
    a. Means of communication: organs of speech, writing, printing, electrical means.
    b. Magnets and lines of force.
    c. The compass and its uses.
    d. Making an electro-magnet.
    e. The electric bell.

    - f. The telegraph and the telephone.
    - g. Submarine cables.
    - h. Wireless telegraph and telephone.
    - i. The making of a newspaper.

Project XVII. Transportation. (Connect closely with the Geography Course and the Civics Course).

1. Importance of transportation in everyday life.
2. Problems, pages 350 to 352.
3. Topics, pages 352 to 371.
    - a. Animal power compared with steam and electric power.
    - b. Water as a means of transportation.
    - c. Specific gravity.
    - d. The floating of iron ships.
    - e. Submarines.
    - f. Steam engines and how they work.
    - g. The locomotive and the steamship.
    - h. Great water and great land routes.
    - i. How a gas engine works.
    - j. The automobile.
    - k. The parts and the working of an electric motor.
    - l. Electric cars and locomotives.
    - m. The dynamo as compared with an electric motor.
    - n. The principle of the dynamo; power stations.
    - o. Kinds of water wheels.
    - p. Forests as the regulators of the flow of water.
    - q. Methods of protecting forests.
4. Individual projects, page 371.

Project XVIII. Life,—Its Origin and Betterment.

1. The changing life upon the earth.
2. Problems, pages 374 to 376.
3. Topics, pages 376 to 390.
    - a. Methods of reproduction; seeds, eggs, plants.
    - b. The parts of a flower and their work.
    - c. Summary of steps in the development of a seed.
    - d. Reproduction in higher forms of animals.
    - e. How cross-pollination is accomplished.
    - f. The meaning of heredity, of variation and selection.
    - g. Improving living conditions.

    - h. Preventive medicine.
    - i. Vaccination and inoculation.
    - j. Destroying flies and mosquitoes.
    - k. Improving your own environment.
4. Individual projects, page 390.

Reference List.

Consult Van Buskirk and Smith's "Books That Will Help You" at the ends of Chapters in "The Science of Everyday Life".

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